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ANTHROPOLOGICAL PAPERS

Numbers 33–42

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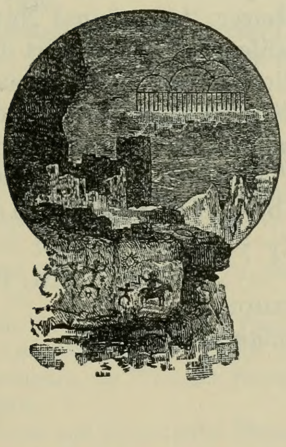

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LETTER OF TRANSMITTAL

Smithsonian Institution,
Bureau of American Ethnology,
Washington, D. C., September 15, 1950.

Sir: I have the honor to submit the accompanying manuscripts, entitled "Of the Crow Nation," by Edwin Thompson Denig, edited by John C. Ewers; "The Water Lily in Maya Art: A Complex of Alleged Asiatic Origin," by Robert L. Rands; "The Medicine Bundles of the Florida Seminole and the Green Corn Dance," by Louis Capron; "Technique in the Music of the American Indian," by Frances Densmore; "The Belief of the Indian in a Connection between Song and the Supernatural," by Frances Densmore; "Aboriginal Fish Poisons," by Robert F. Heizer; "Aboriginal Navigation off the Coasts of Upper and Baja California," by Robert F. Heizer and William C. Massey; "Exploration of an Adena Mound at Natrium, West Virginia," by Ralph S. Solecki; "The Wind River Shoshone Sun Dance," by D. B. Shimkin; and "Current Trends in the Wind River Shoshone Sun Dance," by Fred W. Voget; and to recommend that they be published as a bulletin of the Bureau of American Ethnology.

Very respectfully yours,

M. W. Stirling, *Director.*

Dr. Alexander Wetmore,
Secretary, Smithsonian Institution.

PUBLISHER'S NOTE

A separate edition is published of each paper in the series entitled "Anthropological Papers." Copies of Papers 1–42 are available at the Bureau of American Ethnology, Smithsonian Institution, and can be had free upon request.

List of Anthropological Papers Published Previously

No. 1. A Preliminary Report on Archeological Explorations at Macon, Ga., by A. R. Kelly. Bull. 119, pp. v-ix, 1–68, pls. 1–12, figs. 1–7. 1938.
No. 2. The Northern Arapaho Flat Pipe and the Ceremony of Covering the Pipe, by John G. Carter. Bull. 119, pp. 69–102, figs. 8–10. 1938.
No. 3. The Caribs of Dominica, by Douglas Taylor. Bull. 119, pp. 103–159, pls. 13–18, figs. 11–37. 1938.
No. 4. What Happened to Green Bear Who Was Blessed with a Sacred Pack, by Truman Michelson. Bull. 119, pp. 161–176. 1938.
No. 5. Lemhi Shoshoni Physical Therapy, by Julian H. Steward. Bull. 119, pp. 177–181. 1938.
No. 6. Panatübiji', an Owens Valley Paiute, by Julian H. Steward. Bull. 119, pp. 183–195. 1938.
No. 7. Archeological Investigations in the Corozal District of British Honduras, by Thomas and Mary Gann. Bull. 123, pp. vii–viii, 1–57, 61–66, pls. 1–10, figs. 1–11. 1939.
Report on Two Skulls from British Honduras, by A. J. E. Cave. Bull. 123, pp. 59–60. 1939.
No. 8. Linguistic Classification of Cree and Montagnais-Naskapi Dialects, by Truman Michelson. Bull. 123, pp. 67–95, fig. 12. 1939.
No. 9. Sedelmayr's Relación of 1746. Translated and edited by Ronald L. Ives. Bull. 123, pp. 97–117. 1939.
No. 10. Notes on the Creek Indians, by John R. Swanton. Bull. 123, pp. 119–159, figs. 13, 14. 1939.
No. 11. The Yaruros of the Capanaparo River, Venezuela, by Vincenzo Petrullo. Bull. 123, pp. 161–290, pls. 11–25, figs. 15–27. 1939.
No. 12. Archeology of Arauquin, by Vincenzo Petrullo. Bull. 123, pp. 291–295, pls. 26–32. 1939.
No. 13. The Mining of Gems and Ornamental Stones by American Indians, by Sydney H. Ball. Bull. 128, pp. ix-xii, 1–78, pls. 1–5. 1941.
No. 14. Iroquois Suicide: A Study in the Stability of a Culture Pattern, by William N. Fenton. Bull. 128, pp. 79–138, pls. 6–8. 1941.
No. 15. Tonawanda Longhouse Ceremonies: Ninety Years after Lewis Henry Morgan, by William N. Fenton. Bull. 128, pp. 139–166, pls. 9–18. 1941.
No. 16. The Quichua-speaking Indians of the Province of Imbabura (Ecuador) and Their Anthropometric Relations with the Living Populations of the Andean Area, by John Gillin. Bull. 128, pp. 167–228, pls. 19–29, figs. 1-2. 1941.

No. 17. Art Processes in Birchbark of the River Desert Algonquin, a Circumboreal Trait, by Frank G. Speck. Bull. 128, pp. 229–274, pls. 30–42, figs. 3–25. 1941.

No. 18. Archeological Reconnaissance of Southern Utah, by Julian H. Steward. Bull. 128, pp. 275–356, pls. 43–52, figs. 26–77. 1941.

No. 19. A Search for Songs among the Chitimacha Indians in Louisiana, by Frances Densmore. Bull. 133, pp. 1–15, pls. 1–4. 1942.

No. 20. Archeological Survey on the Northern Northwest Coast, by Philip Drucker; with Appendix, Early Vertebrate Fauna of the British Columbia Coast, by Edna M. Fisher. Bull. 133, pp. 17–142, pls. 5–9, figs. 1–33. 1943.

No. 21. Some Notes on a Few Sites in Beaufort County, South Carolina, by Regina Flannery. Bull. 133, pp. 143–153, figs. 34–35. 1943.

No. 22. An Analysis and Interpretation of the Ceramic Remains from Two Sites near Beaufort, South Carolina, by James B. Griffin. Bull. 133, pp. 155–168, pls. 10–12. 1943.

No. 23. The Eastern Cherokees, by William Harlen Gilbert, Jr. Bull. 133, pp. 169–413, pls. 13–17, figs. 36–55. 1943.

No. 24. Aconite Poison Whaling in Asia and America: An Aleutian Transfer to the New World, by Robert F. Heizer. Bull. 133, pp. 415–468, pls. 18–23A, figs. 56–60. 1943.

No. 25. The Carrier Indians of the Bulkley River: Their Social and Religious Life, by Diamond Jenness. Bull. 133, pp. 469–586, pls. 24–34, figs. 61–62. 1943.

No. 26. The Quipu and Peruvian Civilization, by John R. Swanton. Bull. 133, pp. 587–596. 1943.

No. 27. Music of the Indians of British Columbia, by Frances Densmore. Bull. 136, pp. 1–100, pls. 1–9, figs. 1–2. 1943.

No. 28. Choctaw Music, by Frances Densmore. Bull. 136, pp. 101–188, pls. 10–21, figs. 3–4. 1943.

No. 29. Some Ethnological Data Concerning One Hundred Yucatan Plants, by Morris Steggerda. Bull. 136, pp. 189–226, pls. 22–24. 1943.

No. 30. A Description of Thirty Towns in Yucatan, Mexico, by Morris Steggerda, Bull. 136, pp. 227–248, pls. 25–28. 1943.

No. 31. Some Western Shoshoni Myths, by Julian H. Steward. Bull. 136, pp. 249–300, 1943.

No. 32. New Material from Acoma, by Leslie A. White. Bull. 136, pp. 301–360, pls. 29–32, fig. 5. 1943.

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SMITHSONIAN INSTITUTION
Bureau of American Ethnology
Bulletin 151

Anthropological Papers, No. 33

"Of the Crow Nation"

By EDWIN THOMPSON DENIG

Edited
With biographical sketch and footnotes
By John C. Ewers

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INTRODUCTION

THE LIFE AND WORKS OF EDWIN THOMPSON DENIG

In North America the white man's application of knowledge of Indian cultures to the solution of practical problems long antedated the development of ethnology as a profession. The first white men to seek knowledge of the Indian tribes of the Northern Great Plains were the fur traders. In order to gain a precarious foothold in that region, to establish and expand their business, it was imperative that they obtain not only a working knowledge of the Indian languages but also a fund of reliable, useful information on the locations and numbers of the several tribes and of their major subdivisions, their seasonal movements, their basic economies, forms of government, intertribal relations, methods of making war, and social customs. A few of the more intelligent traders recognized that the information they had gathered on these subjects would be of interest to others, even to people far removed from the Indian country. Much of our present knowledge of the cultures of the Northern Plains Indians prior to 1850 has been derived from the writings of these men. The names of several trader-writers readily come to mind—Pierre La Verendrye, Jean-Baptiste Trudeau, Pierre-Antoine Tabeau, François Larocque, Alexander Mackenzie, David Thompson, and the two Alexander Henrys. Each of these French or Canadian writers has made a substantial contribution to ethnology. The United States has produced a single trader whose contributions to the ethnology of the Indian tribes of the Northern Plains are deserving of rank with those of the individuals mentioned. He was Edwin Thompson Denig.

Edwin Thompson Denig was born in McConnellstown, Huntingdon County, Pa., March 10, 1812. He was the son of Dr. George Denig, a physician. The Denig family traced its descent from Herald Ericksen, a chieftain of the Danish island of Manoe in the North Sea. Although Denig's writings show clearly that he was a man of better than average education for his time, nothing is known of his activities prior to his entrance into the fur trade at the age of 21. It is most probable that Alexander Culbertson, a native of nearby Chambersburg, encouraged Denig to seek a career in the fur trade. Culbertson, 3 years Denig's senior, had gained some experience in the trade on St. Peter's River prior to visiting his family in Pennsylvania in the

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summer of 1832. Denig joined Culbertson in the service of the American Fur Co. the following year. Records of that company, in the Missouri Historical Society, St. Louis, dated April 10, 1833, credit Edwin T. Denig with $400 for "Services ending 1 year from date."

It is noteworthy that Denig first traveled up the Missouri River in the same year, and possibly on the same steamboat, as did the noted German scientist-explorer, Maximilian, Prince of Wied-Neuwied, and Karl Bodmer, author and illustrator respectively of Travels in the Interior of North America, a work which for more than a century has been regarded as a basic source on the Indians of the Upper Missouri. For the German prince and his talented artist companion the trip offered an opportunity for a year's adventure and observation in a strange and exciting environment. For Denig it marked the beginning of 23 years' residence among the Indians of the Upper Missouri as a fur trader. Denig became one of many subordinates in the employ of the American Fur Co. (which became Pratte, Chouteau & Co. in 1834, and continued under the firm name of Pierre Chouteau, Jr., & Co. after 1838). This was the principal firm engaged in the fur trade of the Upper Missouri. Its network of posts ranged upriver to the country of the Blackfoot near the Rockies and that of the Crow on the Yellowstone.

Denig's early years in the fur trade were spent in the country of the powerful Teton Dakota. On June 3, 1833, he wrote from Fort Pierre, the principal trading post in Teton country, "I will remain here this year" (Denig-Sarpy letter, Missouri Hist. Soc.). Four letters from William Laidlaw, bourgeois of Fort Pierre, to Denig (in the same collections) indicate that Denig was in charge of a small winter trading house subordinate to Fort Pierre during the winter of 1834–35. This house seems to have been located on Cherry River, a tributary of the Cheyenne, some sixty or more miles northwest of Fort Pierre.

In the spring of 1837, Denig held the position of post bookkeeper at Fort Union on the Missouri near the mouth of the Yellowstone (Larpenteur, 1898, vol. 1, p. 122). In a letter to Jacob Halsey at Fort Pierre, dated March 25, 1837 (in Missouri Hist. Soc.), Denig stated that he was well satisfied with his position and much preferred Union to Pierre. This letter also revealed that he had followed the custom of many white traders in that region in taking an Indian wife, and that he was the father of a boy. When smallpox reached Fort Union that summer Denig became infected but recovered "favorably" (Larpenteur, 1898, vol. 1, p. 132). Years later he wrote two accounts of the terrible ravages of that plague among the Assiniboin, based upon his first-hand knowledge of the circumstances (Denig, 1930, pp. 399–400; Denig Mss., Missouri Hist. Soc., pp. 99–100).

When John James Audubon, the noted artist-naturalist, visited Fort Union in the summer of 1843, Denig cheerfully assisted him in collecting bird and mammal specimens and helped him to obtain the head of an Indian chief from a tree burial near the fort. Denig enlivened Audubon's stay with stories of Indians and animals of the region. At the naturalist's request he wrote a description of Fort Union which has been published in Audubon and His Journals, volume 2, pages 180–188. Dated July 30, 1843, this is the earliest known example of Denig's descriptive writing. It is also the most detailed description of the construction and use of that most important Indian trading post on the Upper Missouri to be found in the literature. Denig stated that he was then in charge of the office of the fur company at Fort Union, a position comparable to that of chief clerk. His old friend Alexander Culbertson was Fort Union's bourgeois at that time.

Charles Larpenteur, a fellow subordinate in the service of the company, criticized Denig severely for his love of liquor, mentioning an occasion in January 1844, when Denig was unable to make a trip to Woody Mountain to trade for robes with the Cree and Chippewa because he had imbibed too freely (Larpenteur, 1898, vol. 1, pp. 162, 184–186). Drinking was common among field employees of the company, forced to spend long, monotonous winters at isolated posts in the cold north country. Denig was no teetotaler. In a letter to Alexander Culbertson, dated December 1, 1849, he wrote, "I would also request as a great favor if you will bring me up a keg say 5 galls of good old Rye, to have the pleasure of drinking your health occasionally. I can hardly look upon myself as the infernal drunkard represented and presume as no accident happened to the 2 g^{l}. keg of last spring, the 5 g^{l}. keg will be equally safe." In the same letter Denig reported, "Next year after the post has been thoroughly purged of all superfluities In a trade of 400 packs, I shall clear 6000$ if 500 packs are traded 9000$ will be the profit . . . you can assure yourself of my showing a neat Balance to our credit" (Letter in Missouri Hist. Soc.). This was the kind of report on Denig's activities that the company preferred to take seriously.

In the spring of 1847, Larpenteur (1898, vol. 1, p. 250) had referred to Denig as "the clerk at Fort Union." Denig's letter to Culbertson, quoted above, indicates that he was promoted to the position of bourgeois in charge of Fort Union before the winter of 1849–50. Fort Union not only was "the principal and handsomest trading post on the Missouri River," as Denig himself termed it; it was also the company's key point in its control of the Indian trade of the Upper Missouri. There the Assiniboin, Plains Cree, some Crow, and Chippewa Indians traded. From Fort Union employees, trade goods and supplies were dispatched to the upriver Blackfoot and Crow posts, and to it came their returns of furs and skins in the spring for reshipment downriver to St. Louis. No field employee of the company then held a more responsible position than did Denig, except for his friend Alexander Culbertson, who had been promoted to general supervisor of all the company's posts on the Upper Missouri.

Denig again rendered valuable services to naturalists during the winter of 1849–50. At the request of Alexander Culbertson, and with the assistance of Ferdinand Culbertson, Denig prepared skins and skulls of birds and mammals of the Upper Missouri for use in scientific study. On December 1, 1849, he wrote A. Culbertson: "I am progressing with my specimens of animals for you as I have said I would & have already prepared the White Wolf, the Beavers, the War Eagle, the Caputi Argali or Antelopes head, and sundry other smaller matters which will be in order to put into every museum you think propper" (Letter in Missouri Hist. Soc.). The following June Thaddeus Culbertson, Alexander's brother, visited Fort Union. His Journal, under date of June 17, comments: "We were received very kindly by the gentlemen of the post, Mr. E. T. Denig and Ferdinand Culbertson. They showed me quite a good collection of stuffed skins made by them for Professor Baird, at the request of my brother. This must have cost them a great deal of labor and considerable expense, and they deserve many thanks from the students of natural history for whose benefit this collection was made" (Culbertson, 1851, p. 121). Thaddeus Culbertson brought back many, if not all, of these specimens for the collections of the Smithsonian Institution, which was then only in the fourth year of its existence. The earliest accession book of the division of mammals of the United States National Museum records specimens from Fort Union received from "E. T. Denig and A. Culbertson." A few of them are specifically indicated as "Prepared by Denig." Several other specimens, listed as collected by Thaddeus Culbertson at Fort Union, may have been prepared by Denig also. In toto these specimens include skins of the wolverine, plains wolf, lynx, beaver, mountain sheep, antelope, white-tailed jack rabbit, and grizzly bear; the head of a bison; and skulls of elk, mule deer, and bison. Thus in 1850 the Smithsonian Institution acquired an extensive representation of the mammals of the Upper Missouri as a direct result of the interest and labors of Denig and the Culbertsons.

Father Pierre Jean De Smet, noted missionary to the Indians of the Northwest, spent more than 2 weeks at Fort Union in the summer of 1851. He found in Denig a man who knew the Upper Missouri tribes well and who was sympathetic toward them. Between the famous

Catholic priest and Denig, who was Swedenborgian in his beliefs, a firm friendship developed that endured for the remainder of Denig's life. It is likely that during this visit to Fort Union De Smet encouraged Denig to write for him a number of sketches of the manners and customs of the Assiniboin and neighboring tribes. Apparently Denig lost little time in initiating the project, for in September of the same year Kurz observed that Denig was recording "stories" of "Indian legends and usages" for "Père De Smet" (Kurz, 1937, p. 133).

We may never know the full extent of Denig's writings for Father De Smet. However, it is possible to trace some of them with precision through the published correspondence of the priest. De Smet expressed his "gratitude for the manuscript you have had the kindness to prepare for me, and which I shall be most glad to receive and peruse," in a letter to Denig written in May 1852. By the next fall the priest had received the manuscript. On September 30 he wrote thanking Denig profusely for "your very interesting series of narratives . . . I have read the present series with absorbing attention and growing interest. My imagination has often carried me back to scenes long familiar to my experience and to others of a general and kindred nature which your pen has so well portrayed, in your valuable descriptions of their religious opinion, of their great buffalo hunt, their war expeditions, and in the histories of old Gauche and of the family of Gros François" (Chittenden and Richardson, 1905, vol. 4, pp. 1215–1216, 1482).

Father De Smet incorporated much of Denig's information in a series of letters to Father Terwecoren, editor of the Précis Historiques, Brussels, Belgium. These letters were reprinted in English in the book "Western Missions and Missionaries: A Series of Letters by Rev. P. J. De Smet," published in New York City in 1863. Letters X through XIII, comprising pages 134–205 of that volume, deal in turn with "Religious Opinions of the Assiniboins," "Indian Hunts," "Indian Warfare," and "Tchatka" (a biographical sketch of old Gauche). In the thirteenth letter, Father De Smet acknowledged his debt to Denig. "I cite the authority of Mr. Denig, an intimate friend, and a man of high probity, from whom I have received all the information that I have offered you concerning the Assiniboins, and who resided among them during twenty-two years." Denig's account of the family of Le Gros François (acknowledged in the priest's letter of September 30, 1852, quoted above) was not published in De Smet's lifetime. Father De Smet recorded the story in longhand in the Linton Album, from which source it was obtained for publication in Chittenden and Richardson's Life, Letters, and Travels of Father Pierre Jean De Smet (1905, vol. 3, pp. 118–124).

Rudolph Kurz, a young Swiss artist, possessed of a burning desire to sketch and paint wild Indians in their home environment, spent 7 months at Fort Union, from September 4, 1851, to April 11, 1852. The Journal of Rudolph Friederich Kurz, published by the Bureau of American Ethnology in 1937, contains a vivid account of life at Fort Union during that period. Frequent references to Denig in this journal provide an insight into his character that cannot be found in Denig's own, very impersonal writings.

Before his arrival at Fort Union, Denig had been represented to Kurz by a former, dissatisfied employee as a "hard man, liked by nobody . . . keeps two Indian wives . . . squanders all he has on them; begrudges anything paid the employees, oppresses the engagees with too much work, is never satisfied, etc." (Kurz, 1937, p. 101).

On first meeting Denig, Kurz described him as—

> a small, hard featured man wearing a straw hat, the brim of which was turned back . . . He impressed me as a very prosy fellow. He stopped Bellange [Kurz' traveling companion from Fort Berthold to Union] short, just as the latter was beginning a long story he wished to tell; on the other hand, he ordered supper delayed on our account that we might have a better and more plentiful meal. A bell summoned me to the first table with Mr. Denig and the clerks. My eyes almost ran over with tears! There was chocolate, milk, butter, omelet, fresh meat, hot bread—what a magnificent spread! I changed my opinion at once concerning this new chief; a hard, niggardly person could not have reconciled himself to such a hospitable reception in behalf of a subordinate who was a total stranger to him. [Kurz, 1937, p. 120.]

It is apparent, however, from Kurz' later observations, that Denig exercised an authority over his men that would have been the admiration of his seafaring Danish ancestors. Denig's crew of some 50 men included workmen of a score of nationalities, many of whom were neither skilled nor ambitious. He kept them "strictly under his thumb." When they worked satisfactorily he offered some diversion for all of them. If they shirked, he limited their victuals. He expected his clerks, as good petty officers, to give him moral and, if need be, physical support in handling his men. He insisted on economy and efficiency on the part of his clerks to keep the overhead at a minimum.

Kurz observed that Denig had risen to his position of command as a result of "his commercial knowledge, his shrewdness, and his courage at the posts where he was earlier employed" (Kurz, 1937, p. 123). As a successful trader he also had to gain and hold the friendship of the Indians. Kurz learned that Denig had "made a thorough study of Indian life—a distinct advantage to him in trade" (Kurz, 1937, p. 126). But it was not enough for him to know the Indian languages, their manners, and customs. He must conduct himself in such a way as to win their respect. Denig believed most Indians esteemed white men for those talents they did not possess themselves; that though he had a keen eye and was a sure shot, the Indians would never admire him for his hunting ability. He thought white men who adopted Indian dress and tried to follow Indian customs only succeeded in degrading themselves in the eyes of the Indians. Although Denig had two Indian wives, he encouraged them to live as much like white women as was possible in the Indian country. Records of Denig's purchases from the company (in the Missouri Hist. Soc.) tell of his importation of fine clothes for his wives and children, fancy foods for his table, candy and toys for his children. He kept up with the news and thought of the day by reading newspapers and books on philosophy and religion brought upriver from St. Louis. Edwin T. Denig was far removed from the crude hunter-trapper-trader stereotype of fiction. His way of life undoubtedly helped him to maintain the high degree of objectivity toward Indian cultures evidenced in his writings.

In his long conversations with Kurz, recorded in the latter's Journal, Denig revealed a very limited appreciation of art, but a lively interest in religion and morals, about which he expressed very definite opinions. One evening Denig came round to the subject of love. "Love—damn the word!—is a madness in the brain; a contagious disease, like smallpox or measles. I would rather have a dose of epsom salts than to recall the folly of first love—pure love. If it is not stopped, that lunacy makes one ridiculous, childish, ashamed of himself." Kurz, a confirmed romanticist, probably swallowed hard before adding the following sentence to his diary. "There is always something true and worth while in what he says, only he expresses himself in strong language" (Kurz, 1937, p. 180).

Much of their conversation concerned the Indians in whom both men were interested. Denig enjoyed telling the young artist stories of his experiences among the Indians, of Indian customs and personalities. Denig also read to Kurz from the manuscript he was preparing for Father De Smet and told him of his concern for the future of the Indians. Denig went out of his way to give Kurz opportunities to meet Indian chiefs and outstanding warriors who visited the fort, to attend councils he held with these Indian leaders, to obtain Indian artifacts and animal specimens for his collections, and to study the wildlife of the plains in the field. Denig seemed to have been as eager to help this unknown Swiss artist as he had been to aid the famous Audubon and Father De Smet.

In the middle of the century Henry R. Schoolcraft, of the Office of Indian Affairs in Washington, was busy collecting information on the Indians of the United States for historical, anthropological, and administrative purposes. To students of the Indians and to individuals who had traveled extensively or lived in the Indian country he sent copies of a printed circular of "Inquiries Respecting the History, Present Condition, and Future Prospects of the Indian Tribes of the United States." One of these circulars reached Denig at Fort Union. Cooperative, as he had always been in furnishing information about Indians to earnest inquirers, Denig systematically set about assembling data for Schoolcraft. He submitted an Assiniboin vocabulary of more than 400 words which Schoolcraft published (1854) in the fourth volume (pp. 416–422) of his imposing six-volume compilation, "Historical and Statistical Information Respecting the History, Condition and Prospects of the Indian Tribes of the United States." Eight years later F. V. Hayden referred to this as "the most important vocabulary of the language" of the Assiniboin "prepared by Mr. E. T. Denig, an intelligent trader" (Hayden, 1862, p. 381).

Denig also painstakingly prepared answers to the 348 questions regarding Indian cultures asked in Schoolcraft's circular. His reply was made in the form of a "Report to Hon. Isaac I. Stevens, Governor of Washington Territory, on the Indian Tribes of the Upper Missouri, by Edwin Thompson Denig." This was a manuscript of 451 pages. In his letter of transmittal Denig gave an indication of his research methods. He had not been content merely to draw upon his knowledge of the Indians obtained through long association with and observation of them. He had pursued "the different subjects . . .in company with the Indians for an entire year, until satisfactory answers had been obtained and their motives of speech or action well understood before placing the same as a guide and instruction to others." Internal evidence in the manuscript itself and a statement in the letter of transmittal to Governor Stevens referring to the author's "constant residence of 21 years among the prairie tribes" attest that the manuscript was completed in 1854. This report remained in manuscript form for 76 years. It was published in the Forty-sixth Annual Report of the Bureau of American Ethnology in 1930. Although, as its published title (Indian Tribes of the Upper Missouri) implies, the work was intended to cover all the tribes of the region from the Dakota to the Crow and Blackfoot, the wealth of detailed information presented refers primarily to the Assiniboin. Much of the material on the other tribes takes the form of brief comparative statements. As it stands, Denig's Indian Tribes of the Upper Missouri certainly is the most detailed and important description of Assiniboin Indian culture in midnineteenth-century buffalo days known to ethnology.

By 1854, Denig had resided continuously in the Indian country for 21 years, except for one brief visit to his relatives in the States in the summer of 1845. His diligence and ability had brought him success as a fur trader. He held partnership in the company, receiving one twenty-fourth of its profits from the trade. Yet in a letter to Bishop Miege, written September 1, 1854, he revealed his intention "to leave this country in a year or two" (Letter in Archives of Missouri Province Educational Institute, St. Louis). This decision was based primarily on his consideration for the welfare of his children. There were no schools in the Upper Missouri country. Denig had sent his eldest son, Robert, to Chicago to be educated (Kurz, 1937, p. 136). But he now had three other children to be considered—Sarah (born August 10, 1844), Alexander (born May 17, 1852), and Ida (born August 22, 1854).

In the summer of 1855, Denig took his Assiniboin wife, Deer Little Woman, and his mixed-blood children to visit his brother, Augustus, in Columbus, Ohio. In St. Louis en route Denig and Deer Little Woman were formally married by Father Daemen. Their children were baptized while in that city. Denig's daughter Sarah recalled that the family found the climate in Columbus too warm for them. Otherwise they might have settled there. Instead they returned to Fort Union by a roundabout route, traveling from St. Louis to St. Paul and the Red River Settlement of present Manitoba by horse and wagon. Throughout this journey Denig was searching for a suitable future home for his family. The party reached Fort Union on November 28, 1855, after a wagon trip of nearly 3 months' duration. Much of the route passed through unsettled Indian country (Montana Hist. Soc. Contr., vol. 10, p. 151, 1940).

The Denigs spent the winter at Fort Union. In the middle of the following summer the family moved to the Red River Settlement in Canada. Denig received a payment from P. Chouteau, Jr., & Co. at Fort Union on July 13, 1856 (Company Records in Missouri Hist. Soc.). His will, dated September 12, 1856, at Red River Settlement, Red River of the North, must have been drawn up shortly after the family's arrival there. Very little is known of Denig's life in Canada during the next 4 years. He placed Sarah and Alexander in Catholic schools. He is said to have "established himself as a private trader on the White Horse Plains west of the present city of Winnipeg" (Vickers, 1948, p. 136). His friend De Smet wrote him January 13, 1858, "I rejoice greatly at your success and in the welfare of your children" (Chittenden and Richardson, 1905, vol. 4, p. 1499).

Late in the summer of 1858, Edwin T. Denig was stricken with an inflammation. His daughter Sarah believed it was appendicitis. He died on the White Horse Plains, September 4, 1858, and was buried in the Anglican cemetery near the present village of Headingly, Manitoba (Vickers, 1948, p. 136). He was only 46 years of age at the time of his death.

Edwin T. Denig's close friend and long-time colleague in the fur trade of the Upper Missouri, Alexander Culbertson, survived Denig by 21 years. Prior to 1936, the Missouri Historical Society of St. Louis purchased from A. C. Roberts, of Spokane, Wash., a collection of manuscript materials dealing with several Indian tribes of the Upper Missouri. Mr. Roberts stated that this collection had been in the possession of his recently deceased mother, Julia Culbertson Roberts, who in turn received it from her father, Alexander Culbertson. The writings bore internal evidence of composition in 1855 and 1856, but their authorship was not known. In the archives of the Missouri Historical Society this material became known as the Culbertson manuscript.

Early in February 1949, this editor saw and read parts of the Culbertson manuscript in the Missouri Historical Society. He was impressed with its historical and ethnological significance. It appeared to him that the author's style, as well as some of the specific information in the manuscript, resembled closely that of Edwin T. Denig's published work, Indian Tribes of the Upper Missouri. Upon request, the Bureau of American Ethnology kindly furnished this editor an example of Denig's known handwriting in the form of photographs of his handwritten will, executed September 12, 1856, which he was able to compare with the writing in the Missouri Historical Society manuscript early in March of the same year. Similarities between the handwriting of the two documents appeared so marked as to justify obtaining the opinion of handwriting experts. Accordingly, photostats of pages of the manuscript together with photographs of the will were submitted to the Federal Bureau of Investigation. On April 15, 1949, handwriting experts of the FBI Laboratory, Washington, D. C., reported their conclusion that the handwriting of the two documents was by the same individual. Thus, nearly a century after it was written, an important Denig manuscript was discovered.

This Denig manuscript comprises a portion of the text for a book of extensive proportions. The manuscript is in two parts. Although the pages of one part are numbered 1 to 153 in pencil, pages 61 to 92 are missing. Present are chapter 1 (pp. 1–10), comprising the author's introduction; chapters 2 and 3 (pp. 11–44) entitled "Of the Sioux"; chapter 4 (pp. 45–59) entitled "Of the Arickaras"; the latter and undoubtedly the greater part of chapter 6 (pp. 93–120), comprising a description of the Assiniboin; and chapters 7 and 8 (pp. 121–153) entitled "Of the Crees or Knisteneau." It is probable that the missing chapter 5 described the Mandan and/or Hidatsa. The second part entitled "Of the Crow Nation" is separately paged (pp. 1–75). However, there can be little doubt that this was intended as a later chapter in the same book.

In his opening chapter Denig clearly states the purpose of his book:

> It would be well for the public if everyone who undertook to write a book was thoroughly acquainted with the subject of which he treats, but unfortunately this is not the case—authors spring up everywhere, and the community is saddled with an immense effusion of literature, the greater part of which when divested of the writer's own fancies and feelings, and submitted to the test of truth and experience, amounts to nothing. This is particularly the case in most of the works purporting to describe the actual life and intellectual capacity of the Indians of North America; much evil has been the consequence of error thus introduced, bad feelings engendered, and unwise legislation enforced, which will continue until our rulers are enlightened as to the real state of their Government, character, organization, manners and customs, and social position. Most information extant on these heads has been published by transient visitors amongst the tribes, travelers through a portion of their country, or collected from rude and half-civilized interpreters whose knowledge is but a degree in advance of their savage parents, and also impose upon their credulous hearers tales of fiction mingled with some ceremonies; which with a hastily collected and ill-digested mass of information form the basis of works by which the public are deceived as to the real state of the Indians. Even foreigners who have possibly passed a winter at some of the trading posts in the country, seen an Indian dance or two or a buffalo chase, return home, enlighten Europe if not America with regard to Indian character; which is only the product of their own brains and takes its color from the peculiar nature of that organ. Hence we find two sets of writers both equally wrong, one setting forth the Indians as a noble, generous, and chivalrous race far above the standard of Europeans, the other representing them below the level of the brute creation. People cannot form an opinion in this way—a correct knowledge of any nation, and more particularly of a savage one, must be and only is attained by being as it were raised in their camps, entering into their feelings and occupations, understanding their language, studying their minds and motives, and being thoroughly acquainted with their government, customs, and capacities.
>
> Of the few traders who reside in the Upper Missouri territory, but a small portion have had the advantage of education, and these are so variously and constantly occupied as not to be disposed to apply their talents to writing histories, indeed it has been their policy to keep people in ignorance as to the trade and real disposition of the Indians, thereby preventing competition and discouraging visitors, both of which greatly militate against their interests. Neither do the gentlemen at the head of the Indian trade desire on all occasions to advance their opinions to persons who cannot, or will not, appreciate them.—Truth, though mighty, will not at all times prevail, although stranger than fiction, cannot be realized. The strange sights and occurrences incident to the country, be they ever so truthfully described, are rejected by previously formed opinion, and the narrator stigmatized, even in the mildest language he could expect, as a teller of strange stories. The author of these pages feels this in the commencement but cares little about it, having set out with the determination to present facts in as true a light as his powers admit, and with the experience of 22 years amongst the Indians, speaking their language, and having been placed in every possible position that men can be amongst them, presumes his opinions are entitled to respect.

Denig's first concern seems to have been with setting the record straight regarding the ethnology of the Upper Missouri tribes. He does not name those individuals who were the objects of his caustic jibes in the first paragraph quoted above. There can be little doubt, however, that they were aimed primarily at George Catlin and Prince Maximilian, whose books, published a decade earlier, had gained wide circulation. Doubtless Denig was familiar with them. Indian-loving Catlin had spent 86 days on the Upper Missouri from Fort Pierre northward in the summer of 1832. Maximilian passed the greater part of a year on the Upper Missouri in 1833–34, wintering among the Mandan. In his criticism of those writers Denig revealed the common disdain of the old hand for the greenhorn. In the case of Maximilian, certainly, this strong criticism does not appear to be justified.

In the letter of transmittal accompanying his Indian Tribes of the Upper Missouri, Denig had expressed his dissatisfaction with his organization of that report, due to the limitations imposed upon it by the nature of the questions asked by Schoolcraft and which he attempted to answer (Denig, 1930, p. 393). In his book he sought to remedy that defect by adopting a new, carefully planned organization of his data. He explained this plan in his introductory chapter as follows:

> The plan intended to be pursued in these pages, that the reader may understand the different traits of Indian character without difficulty or confusion, is, first, to give a short history of each tribe, its geographical position and other peculiarities; after which an inquiry will be instituted into their government, condition, manners, and customs as a body. Most customs and opinions are common to all the tribes, but wherever any great difference is observable, or marked traits to be noticed, they will be found in the compendiums of their separate histories. This is necessary to avoid the constant repetition that would follow if detailed accounts of each tribe were presented.
>
> The Indians of the Upper Missouri territory may be divided into two classes, the roving and the stationary tribes—the former comprising the Sioux, Crows, Assiniboines, Crees, and Blackfeet, the latter, the Grosventres, Mandans, and Arikaras. My object is to show the state of these Indians in former times, what their present condition and what circumstances have tended toward their general advancement or decline; and after a general and minute research into all their motives, acts, religion, government, and ceremonies, conclude with a history of the American fur trade embodying many statements of various matters incident to the lives of trappers and traders.

This was an ambitious program of research and writing. Doubtless Denig was unable to complete it before his death. Certainly the manuscript in the Missouri Historical Society contains no descriptions of the Blackfoot, Grosventres (Hidatsa), or Mandan; no general description of the common factors in the cultures of the Upper Missouri tribes; and no history of the fur trade such as he promised in his introductory chapter. If Denig wrote chapters dealing with all or any of these topics those portions of his manuscript either have been destroyed or their present locations are not known.

Charles van Ravenswaay, director of the Missouri Historical Society, has kindly permitted this editor to make a typed copy of the entire manuscript in the collections of that Society. Selected chapters have been and are being edited for publication by the Missouri Historical Society. Mr. van Ravenswaay has granted permission to the Smithsonian Institution to publish Denig's description of the Crow Indians.

"Of the Crow Nation," from internal evidence, was written in the winter of 1856. It is the last known writing by Edwin T. Denig in the field of ethnology. In accordance with the plan for his volume, Denig did not intend this as a detailed description of Crow culture. Rather it stresses those aspects of the history and culture of that tribe that were unique or more highly specialized among the Crow than among neighboring tribes. The sources of Denig's information on the Crow are not revealed in his writings. We do not know the extent to which Denig traveled in Crow country. It is certain, however, that he met fractions of that tribe repeatedly over a period of two decades when they came to trade at Fort Union. Undoubtedly he also received considerable information on the Crow from Robert Meldrum and other employees of Pierre Chouteau, Jr., & Co., who had lived many years with the Crow as traders. Denig's frequent errors in dating events suggest that he wrote from memory rather than from a journal or diary maintained over the years, and that he had a poor memory for dates. Some of the events he described may have become somewhat distorted through years of verbal retelling prior to the time he first recorded them in writing. Denig was not an infallible authority. However, he was an objective observer of the Indian tribes of his acquaintance. His long experience among the Indians enabled him to distinguish significant differences as well as basic similarities among neighboring tribes of the same culture area. He knew Indians well enough to view them as human beings rather than noble redskins or inhuman brutes. In "Of the Crow Nation" Denig has written one of the most valuable descriptions of Crow Indian culture in nineteenth-century buffalo days known to ethnology. In many respects this account substantiates and elaborates previously published descriptions of that tribe. It also contains significant data on Crow history, biography, and culture that cannot be found in any other source.

To experienced students of the Indians of the Northern Plains the opening pages of "Of the Crow Nation" should have a familiar ring. They have been published, but not under Denig's name. In 1862, the noted geologist, F. V. Hayden, published "On the Ethnography and Philology of the Indian Tribes of the Upper Missouri." In the introduction to that work Hayden stated:

> In all my researches in the Northwest, most important aid has been rendered to me by different members of the American Fur Company. All their stores of

> knowledge of Indian life, language, and character, which they had acquired by years of intercourse with the different tribes, were freely imparted to me, only a small portion of which is given in the following pages. I am especially indebted to Mr. Alexander Culbertson, the well-known agent of the American Fur Company, who has spent thirty years of his life among the wild tribes of the Northwest, and speaks several of their languages with great ease. To Mr. Andrew Dawson, Superintendent of Fort Union, Mr. Charles E. Galpin, of Fort Pierre, and E. T. Denig, of Fort Union, I am under great obligations for assistance freely granted at all times. [Hayden, 1862, p. 234.]

Inclusion of Denig's name in this list is no true measure of Hayden's obligation to him. Page after page of Hayden's descriptions of the Sioux, Arikara, Assiniboin, Plains Cree, and Crow tribes are nearly verbatim renderings of portions of the Denig manuscript in the Missouri Historical Society. It seems most probable that Alexander Culbertson either lent Hayden this manuscript or provided him with an exact copy of it after Denig's death. This may account for Hayden's emphasis on his debt to Culbertson. In justice to Denig we should now recognize that he was the author of a very large portion of the descriptive material in Hayden's publication. Hayden's entire description of the Crow, comprising pages 391–394 of his 1862 work, is but an edited version of the early pages of Denig's "Of the Crow Nation." At the conclusion of that description Hayden wrote:

> I have before me the materials for an extended sketch of the manners and customs, together with biographical sketches of the principal chiefs of this tribe, but, as they will doubtless appear in a future work now in course of preparation, I shall close with a brief notice of the different vocabularies of the Crow language which have been published from time to time. [Hayden, 1862, p. 394.]

There can be little doubt that the "materials" Hayden referred to was Denig's mauscript, "Of the Crow Nation." It is here published in full for the first time.*

The sectional subtitles have been supplied by the editor for the convenience of the reader.

JOHN C. EWERS.

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*The editor is grateful to Mrs. Frances R. Biese, Archivist, Missouri Historical Society, for her kind assistance in locating pertinent data on Denig's life on the Upper Missouri, 1833-56, in the correspondence and records of the American Fur Co. and its successors in the library of that Society. He is indebted to Robert L. Denig, Brigadier General United States Marine Corps (Retired), of Virginia Beach, Va., for the opportunity to read letters from Denig's daughters regarding events of the last 3 years of his life; and to Father Louis J. Hanlon, S. J., Missouri Province Educational Institute, St. Louis, for furnishing a photostatic copy of Denig's letter to Bishop Miege in the archives of that institute. It was Chris Vickers, of Baldur, Manitoba, who furnished the Bureau of American Ethnology a photostatic copy of Denig's original will which aided the identification of the authorship of the Denig manuscript.

"OF THE CROW NATION"

By Edwin Thompson Denig

CROW RELATIONSHIP TO THE HIDATSA

These people were once a part of the Minnetarees or Gros Ventres, with whose history the reader has already been made acquainted.[1] They resided with them, they say, at different places along the banks of the Missouri, where the remains of dirt villages are still to be found. But about 80 years since a quarrel arose which divided them. The cause of the division was this. The nation was governed by two factions each headed by a separate chief, both of whom were desperate men, and nearly equal in the number of their followers. Jealous of each other and striving after supreme command, many difficulties and differences arose from time to time, 'tho they never had proceeded to extremes on these occasions, there being always a sufficient number of wise heads and good hearts to quell such disturbances. But this course of things could not possibly last. Therefore, at a hunt where both chiefs were present with their followers, and a great many buffalo had been killed, the wives of the two leaders quarreled about the manifolds or upper stomach of one of the cows. From words they came to blows, from blows to knives, in which scuffle one of the women killed the other. The relations on both sides took part. The nation armed, each headed by one of the above-named chiefs, and a sharp skirmish ensued in which several were killed on both sides. The result was that about one-half left those on the Missouri and migrated to the Rocky Mountains, through which wild and extensive region they continue to rove.[2] Why they are called Crows we cannot say. The word *Ap sar roo kai*, which is the name they give themselves in their own language, does not mean a crow more than any other kind of bird, the interpretation being simply anything that flies.[3] The language of the Crows has undergone some change since their separation from the Gros Ventres, though enough resemblance remains to identify them as the same people. They have little or no difficulty in conversing with each other. This difference of dialect may arise from association with surrounding nations and incorporating some of their words into their own language.[4]

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[1] There is no chapter on the Hidatsa in the Denig manuscript in the Missouri Historical Society, St. Louis. Denig's description of the Hidatsa may have appeared on some of the pages missing from the manuscript.

DESCRIPTION OF THE CROW COUNTRY

The country usually inhabited by them is through the Rocky Mountains, along the heads of Powder River, Wind River, and Big Horn, on the south side of the Yellowstone, as far as Laramie's Fork on the River Platte. They also are frequently found on the west and north side of that river as far as the head of Muscleshell River, and as low down as the mouth of the Yellowstone.[5] That portion of their country lying east of the mountains is perhaps the best game country in the world. From the base of the mountains to the mouth of the Yellowstone buffalo are always to be found in immense herds. Along that river elk may be seen in droves of several hundred at a time, also large bands of deer both of black-tailed and white-tailed species.[6] Antelope cover the prairies, and in the badlands near the mountains are found in great plenty bighorn sheep and grizzly bear. Every creek and river teems with beaver, and good fish and fowl can be had at any stream in the proper season.

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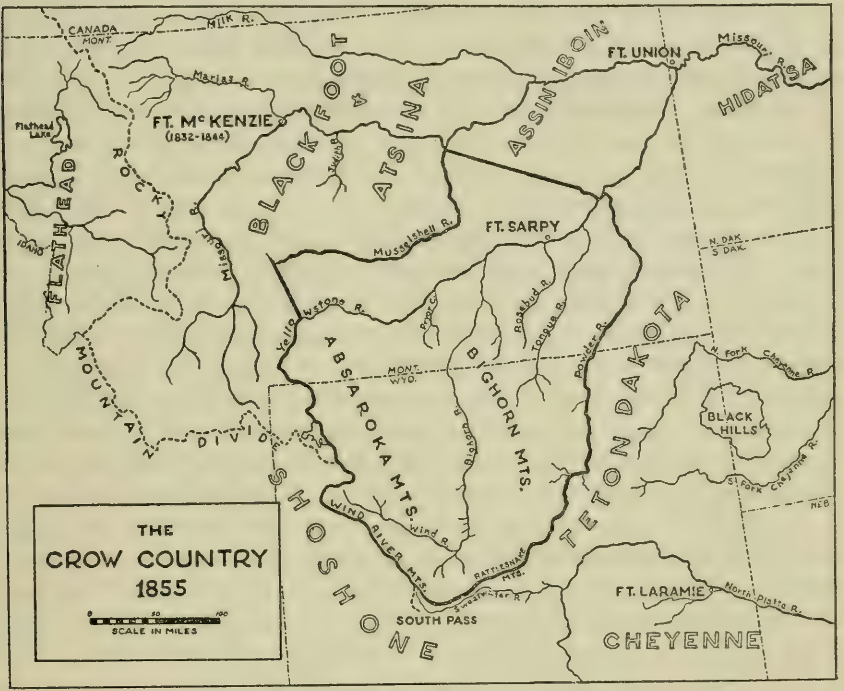
[2] Lowie has pointed out that "the alleged reason for the secession occurs among the traditions of other tribes and cannot be uncritically accepted as historical" (Lowie, 1912, p. 183). Denig's dating of this separation, as published by Hayden (1862, p. 391), has been credited to the latter by more recent writers. Now we know this dating originated in the writing of a man who had far greater knowledge of the ethnohistory of the Northern Plains Indians than did Hayden. Mere separation from the Hidatsa does not explain Crow abandonment of the semisedentary life typical of the Missouri River horticulturalists in favor of the nomadic-hunting existence characteristic of this tribe when first described in some detail by the fur trader François Larocque in 1805. It seems most probable that this Crow cultural transition was part of a more widespread movement that witnessed a similar change in the culture of the Arapaho and Cheyenne, and that it followed the introduction of horses into the area northeast of the Black Hills in the first half, and probably during the second quarter of the eighteenth century. If Crow separation from the Hidatsa took place after horses were introduced, Denig's dating may not be much too late. Lt. Bradley, in an independent study of the Crow in 1876, concluded that this separation "occurred not later than 1775, and possibly a few years earlier" (Bradley, 1896, vol. 2, p. 179). However, Washington Mathews, on the basis of Hidatsa tradition, estimated in 1877 that the separation occurred "doubtlessly, more than one hundred, and probably not less than two hundred years ago" (Mathews, 1877, p. 39). As one of several possible interpretations of the Hagen site, near Glendive, Mont., where scapula digging tools, pottery, and a single earth-lodge site were found, Mulloy has suggested its occupation by the Crow in process of transition from a horticultural to a hunting economy (Mulloy, 1942, pp. 99–102).

[3] The earliest mention of the Crow by that name appears in the journal of the fur trader, Jean Baptiste Trudeau, among the Arikara Indians in 1795. "A war party of the Ricaras arrived on the fifth of June with the scalp of a man of the Crow Nation, a people who live near the Rocky Mountains" (Trudeau, 1912, p. 22). Trudeau also learned that "a Canadian, named Menard, who, for sixteen years has made his home with the Mandan . . . has been several times among the nation of the Crows in company with the Gros Ventres [Hidatsa]" (Trudeau, 1921, p. 175).

[4] The affinity of the Crow and Hidatsa languages was recognized by fur traders in the first decade of the nineteenth century. In 1805 Larocque noted close resemblances between these languages and listed a comparative Hidatsa-Crow vocabulary of 21 words to illustrate the point (Larocque, 1910, pp. 68–69). In the next year Alexander Henry wrote, "The language of the Crows is nearly the same as the Big Bellies" (Henry and Thompson, 1897, vol. 2, p. 399). Mathews (1877, p. 39) suggested that even in the period when the Crows lived in close proximity to the Hidatsa they may have spoken a slightly different dialect from the latter.


CANADA
MONT.
Milk R.
Marias R.
Flathead Lake
FT. Mc KENZIE (1832-1844)
BLACKFOOT
ATSINA
ASSINIBOIN
FT. UNION
Missouri R.
HIDATSA
FLATHEAD
IDAHO
ROCKY MOUNTAIN DIVIDE
Missouri R.
Judith R.
Musselshell R.
FT. SARPY
N. DAK.
S. DAK.
Yellowstone R.
Pryor C.
Rosebud R.
Tongue R.
Powder R.
ABSAROKA MTS.
BIGHORN MTS.
MONT.
WYO.
Bighorn R.
DAKOTA
TETON DAKOTA
N. Fork Cheyenne R.
BLACK HILLS
S. Fork Cheyenne R.
NEB.
SHOSHONE
Wind R.
WIND RIVER MTS.
RATTLESNAKE MTS.
Sweetwater R.
SOUTH PASS
FT. LARAMIE
North Platte R.
CHEYENNE
THE CROW COUNTRY 1855
0 50 100
SCALE IN MILES

MAP 1.—The Crow country, 1855.

The once almost fabulous country of the Rocky Mountains is now so well known as scarcely to need description. The scenery of the district now under consideration does not materially differ from that in other parts of their range. The same high, stony peaks and eternal snows are seen, intersected with fertile valleys and rich land. Most of the rivers whose sources are in these mountains are clear, rapid streams formed from springs which widen into lakes of different sizes according to the nature of the obstruction the water meets with in its descent. In their course through the valleys some of them assume a muddy appearance caused by the falling in of alluvial soil. The spaces between the spurs of the mountains are well covered with rich, grassy field flowers, shrubs, and trees, presenting many beautiful landscapes well worth the painter's pencil. The high ranges of mountains appear to consist of three different portions. From the base, one-third the distance up is well covered with tall pines, poplars, and other trees of large growth. This part of the ascent is also varied by occasional level places well clothed with verdure. The middle or second third is composed of gigantic rocks piled one on the other, often overhanging in such a manner as to present a frightful appearance to the travelers below. Through these rocks stunted cedars and pines, with other shrubs and vines, push their way, taking root where apparently there is no earth. At the end of this part vegetation ceases, and snow commences which continues to the summit. This snow is perpetual, 'tho part of it melts annually, which loss is supplied the ensuing winter. Yet it is presumed no thaw takes place on the summit, but on the sides some distance down. When the snow accumulates on the projections so as to lose its balance it is precipitated below in the form of avalanches something like those of the Alps, taking on its way large rocks and increasing in size as it goes along. Trees give way before it until it finds rest in the lower places where it aids to form the sources of rivers. Snow slides are also common by which piles of snow miles in extent are detached and force their way into the valleys or at least as far as the thickly timbered section. Many parts of these mountains along Powder River and the Big Horn appear to have undergone volcanic action. Pummice stone and different rocks in a state of fusion can be picked up. There are also large towers of melted sand 20 or 30 feet high, some of which can be met with in the valleys isolated from any rock, and surrounded by green prairie for miles every way. Other ridges of hills seem to have been entirely calcined, convulsed by some eruption, after which the rain has washed them into that grotesque appearance known as Mauvaise Terre [sic], which has already been referred to in treating of the Sioux district. Some of the springs near the head of the Yellowstone are bituminous, sending forth a substance like tar, which is inflammable. Others are sulfurous, and one or two boiling. The water in the last is hot enough to cook meat well enough to fit it to be eaten. The Indians describe others to be of a poisonous nature to animals, 'tho the same water is said not to affect the human species. Many beautiful specimens of petrified marine shells, fish, snakes, and wood are to be found along the banks of the Yellowstone and its tributaries, even some distance in the interior. Some of these do not belong to any known living animals of the kind in this country, which would seem to prove that these mountains have at a former period been submarine. Most of the tributaries of the Yellowstone are well wooded; 'tho that river is only well timbered about one-third the distance from its conflux to the base of the mountains, where the pine growth commences, the lower part being altogether cottonwood and the points getting larger from the mouth of Powder River to its junction with the Missouri. The soil is good along the valley of the Yellowstone from the mouth to the Big Horn. Indeed most of the valleys near the mountains through which streams run are fit for tilling purposes, 'tho the want of timber in the interior would always prove a bar to the country's ever being thickly settled by an agricultural population.

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[5] While at the Crow camp on an island in the Yellowstone River a few miles east of present Billings, Mont., September 14, 1805, Larocque recorded the earliest known definition of Crow territory. "They told me that in winter they were always to be found at a Park by the foot of the Mountain a few miles from this or thereabouts. In the spring and fall they are upon this River and in summer upon the Tongue and Horses River" (Larocque, 1910, p. 45). "Horses River" is present Pryor Creek. Today the Crow Reservation lies within the area occupied by the Crow a century and a half ago. Figure 1 of this publication shows the Crow country at the time of Denig's writing, as defined by the Fort Laramie Treaty of 1851, and confirmed in its northern limits by the Blackfoot Treaty of 1855.

The Yellowstone, like the Missouri, rises to its full every spring, owing to the melting of the snow on the lower parts of the mountains. This rise usually comes on about the middle of May and continues till the middle of June, when it commences falling unless kept up by heavy rains. During this high stage of water steamers of light draft might navigate it to the first rapids which are about 150 miles from the mouth. The ice commonly gives way about the first of April, and when broken up suddenly by pressure of water from the mountains, it forms dams quite across the valley raising the water 50 or 60 feet and inundating the neighboring country. The Crow Indians are greatly in fear of the water on these occasions, and suffer severely when taken unaware. The writer was eyewitness to one of these breakings up early in the month of February. About 130 lodges of Crows were encamped on the bank of the Yellowstone where the valley is 3 miles wide to the nearest hills. The water came down upon them in the night so suddenly that they barely escaped with their lives by running to the hills. But the land near the bluffs is lower than that on the bank of the stream, consequently in running that way they encountered water, wading and swimming through it carrying their children. They lost their whole winter's hunt, besides nearly all their arms, ammunition, and other property. When the water fell it left immense quantities of ice piled up around their lodges, which were dug out with great difficulty. Their entire loss on this occasion could not be much less than 10 or 12 thousand dollars' worth of merchandise. A few years ago the American Fur Co.'s fort at the mouth of the Big Horn was inundated in the same way, and a great deal of merchandise and peltries destroyed. This river is, when high, very rapid and dangerous to navigate on account of the rocks, snags, and other obstructions.

Mackinaw boats descend it, but every year furs are lost and men are drowned.

POPULATION AND MAJOR DIVISIONS

The Crow Indians live in skin lodges like the rest of the migratory tribes. They were formerly about 800 lodges or families, but from the usual causes of diminution, sickness, and war, are now reduced to 460 lodges. These are separated into several bands each governed by a chief, and occupying different parts of their territory.[6] Their present range and divisions are nearly as follows. That band headed by "The Big Robber" usually make their winter hunt on the head of Powder River, and of late years take their furs and buffalo robes to the trading houses along the River Platte in the spring; from which they obtain supplies to continue their operations, and move back to winter quarters early in the fall.[7] Another portion, led by "Two Face," is the largest band of the Crows, consisting of about 200 lodges.[8] These generally move about through Wind River Mountains and deal with the American Fur Co.'s traders located up the Yellowstone. The next part of any consideration is that which acknowledges "The Bear's Head" as its leader and which travels along the Yellowstone from the mouth to its head, sometimes passing the winter with the Assiniboines and trading at Fort Union, but more frequently selling the proceeds of their hunt to the traders in the upper part of their country.[9]

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[6] Larocque estimated Crow population at some 300 lodges in 1805, having been reduced from 2,000 lodges by a succession of destructive smallpox epidemics. "Since the great decrease of their numbers they generally dwell all together and flit at the same time and as long as it is possible for them to live when together they seldom part . . . though at such seasons as they are not liable to be attacked they part for a short time" (Larocque, 1910, pp. 55–56). Prior to Chief Rotten Belly's death in 1834, his rivalry with Long Hair resulted in a split of the tribe into two divisions, the River and the Mountain Crow (Bradley, 1923, vol. 9, pp. 312–313; Curtis, 1909, vol. 4, p. 49). Zenas Leonard, the fur trader, found the Crow in "two divisions of an equal number in each" in the fall of 1834 (Leonard, 1904, p. 255). In the period 1833–50, Crow population was estimated at about 400 lodges (Maximilian, 1906, vol. 22, p. 351; Larpenteur, 1898, vol. 1, p. 45; Culbertson, 1851, p. 144). Curtis was told of an incipient third division of the Crow, the Whistle Water clan, who, about the year 1850, hunted apart from the other Mountain Crow on the headwaters of the Big Horn and Powder Rivers (Curtis, 1909, vol. 4, p. 43). Presumably this was Denig's "Big Robber's Band." In 1856 Indian Agent Vaughan estimated Crow population at 450 lodges (Ann. Rep. Comm. Ind. Aff., 1856, p. 80).

[7] Kurz called this chief "Big Robert." He considered him the head chief of the Mountain Crow, and Rottentail head chief of the River Crow in 1851. Rottentail did not attend the Fort Laramie Treaty Council that summer, so that Big Robber was selected by the Government as head chief of the tribe. Kurz indicated that as a result Big Robber "will gain considerable influence through the distribution of gifts provided by the United States; many of Rottentail's adherents will move over to Big Robert's settlement. Besides, Rottentail has not more than 80 tents" (Kurz, 1937, pp. 212, 240).

[8] Two Face's camp traded at Fort Sarpy in April 1855. The next spring a trader named Scott convinced Two Face that the Government annuities at Fort Union contained smallpox, and that he should take his trade to the Platte. Two Face's camp was en route to the Platte when Indian Agent Vaughan reached the Crow country that summer. Vaughan sent runners to turn him back. Two Face returned and agreed to receive annuities for his division of the Crow at Fort Union (McDonnell, 1940, pp. 120, 122, 176, 186–187).

[9] Bear's Head traded at Fort Union in the fall and winter of 1851–52. Kurz referred to him as "the chief in command of the soldiers . . . a warrior of great ability and renown" (Kurz, 1937, pp. 213, 251, 260). The Fort Sarpy journal makes frequent references to Bear's Head's trade at that post in the early months of 1855, and of his trade at Fort Union in March 1856. The journalist termed Bear's Head "a good easy man & lets his people do as they please" about the fort. In 1858 the Lutheran missionaries Braueninger and Schmidt stayed in Bear's Head's camp (McDonnell, 1940, pp. 106, 107, 109, 110, 113, 115, 158–159, 176, 183, 186, 286).

INTERTRIBAL RELATIONS

The whole nation have a rendezvous every summer, when after performing several national solemnities which will be mentioned, they move across the mountains to exchange the greater part of the merchandise traded for horses. This traffic is carried on with the Flat Heads in St. Mary's Valley, or with the Snake and Nez Percé Indians on the headwaters of the Yellowstone.[10] With the natives named, the Crows have been at peace for a long time. Also for the last few years, since 1850, they have been on meeting terms with the Assiniboines. But their natural and eternal enemies are the Blackfeet on the west and the Sioux on the east, with both of whom war has continued from time immemorial without being varied by even a transient peace.[11]

RAIDING FOR HORSES

The Crows are perhaps the richest nation in horses of any residing east of the Rocky Mountains. It is not uncommon for a single family to be the owner of 100 of these animals. Most middle-aged men have from 30 to 60. An individual is said to be poor when he does not possess at least 20.[12] The Blackfeet also have plenty, and this is cause of continual war. Scarcely a week passes but large numbers are swept off by the war parties on both sides. In these depredations men are killed, which calls for revenge by the losing tribe. During a single summer or winter several hundred animals in this way change owners. A great portion of the time of each nation is occupied either in guarding their own horses or in attempts to take those of their enemies.

The Crow Indians take good care of their horses, as much at least as is practicable in their roving manner of life, and more than any other tribe in the North West territory except the Gros Ventres. They drive them often 10 or 12 miles from the camp, where young men are stationed to guard and water them. These horse guards are the younger portion of the families who own them, from the ages of 15 to 25 years, each family taking charge of its own horses and no more. When on the borders of an enemy's country or at any time when war parties are thought to be in the neighborhood, the best horses are brought home and tied to the doors of their lodges in readiness to follow any persons who might steal the rest in the night. These people live in the hourly expectation of losing all their horses, which is their only wealth, to the warriors of the surrounding nations, particularly the Sioux and Blackfeet.

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[10] The pattern of Crow horse trading was well developed as early as the first decade of the nineteenth century. They obtained horses, Spanish riding gear and blankets, and horn bows from the Flathead, Shoshone, and Nez Percé in the west in exchange for objects of European manufacture (metal knives, awls, spear and arrow heads, kettles, ornaments, and a few guns). At the Hidatsa villages they traded some of the horses and other articles obtained from the western tribes, together with dried meat, skin lodges, and clothing prepared by the Crow themselves, for corn, pumpkins, tobacco, and European trade articles. Larocque witnessed this trade in 1805, and Alexander Henry observed it in 1806 (Larocque, 1910, pp. 22, 64, 66, 71–72; Henry and Thompson, 1897, vol. 1, pp. 398–399).

[11] Eighteenth-century writers on the Blackfoot do not mention that tribe's warfare with the Crow. This suggests also that Crow movement westward may have been relatively late. Yet in 1811, Alexander Henry stated "the Crows are the only nation that sometimes venture northward in search of the Slaves" (Blackfoot). He told of both Piegan and Atsina expeditions against the Crow in that year (Henry and Thompson, 1897, vol. 2, pp. 720, 726, 732). The Blackfoot defeated a combined force of Crow and Atsina in their last large-scale battle with the Crow near the Cypress Hills in 1866. However, Crow and Blackfoot continued horse-raiding expeditions against each other until 1884 or 1885.

Hayden's use of Denig's "Of the Crow Nation" ends at this point. (See Hayden, 1862, pp. 391–394.)

[12] In 1805 Larocque observed, "He is reckoned a poor man who has not 10 horses in spring before the trade at the Missouri takes place and many have 30 or 40, everybody rides, men, women, & children" (Larocque, 1910, p. 64). In 1833 the Crow were "said to possess more horses than any other tribe on the Missouri" (Maximilian, 1906, vol. 22, p. 351). Indian Agent Vaughan estimated the Crow owned an average of 20 horses per lodge in 1853 (Ann. Rep. Comm. Ind. Aff., 1853, p. 355).

While writing this, February 1856, a party of Blackfeet took off 70 horses from the camp of Crow Indians at the mouth of the Yellowstone. This they did early in the night so that they were not known to be stolen until about 10 o'clock the next day, when the guard went to look after them. As soon as the discovery was made about 100 Crows started in pursuit, each riding one fast horse and leading another. The Blackfeet had a whole night's start, but the horses had to break a road through deep snow, by which they lost time, while the pursuers had the advantage of a tolerable road made by their trail. For 3 days and 2 nights they kept up the chase, leaving the horses as they became tired and mounting their led animals. At the close of the second day their reserve horses gave out and they continued on foot. Both parties during all this time had neither eaten, drunk, nor slept, and were exposed to intense cold, but the chase being one of life or death, there was no time to be lost in any way. At dark on the evening of the third day the Crows came in the vicinity of the enemies, who also being worn out with fatigue and hunger, had camped, killed a buffalo, and were cooking. They had taken the precaution to drive the horses some miles farther, and being unaware of the proximity of their pursuers, were making fine preparations to pass an agreeable night around their fire. The Crows approached the camp under cover of the darkness and woods of the Yellowstone, but were obliged to make a circuit of a few miles where they found their horses, quietly grazing, which they recaptured and drove some distance below the fires of their enemies. After accomplishing this, some of them wished to charge upon them in the night. But their leader waited the breaking of day, when, as he expected, they would separate in different directions to hunt the horses, and they could kill one without danger to themselves. The result was what he anticipated. Early in the morning two men followed the tracks of the horses to near where the Crows lay in wait for them. These they charged upon. One escaped but the other did not or could not run. He endeavored to fire his gun, but was stabbed and scalped alive, and afterwards cut up. No further attempt was made on the rest hard by. They had accomplished what they came to do—got back their horses and killed a man without losing any of their party, which is a better coup than killing several enemies with the loss of a man on their side.

Such skirmishes and chases are of daily occurrence summer and winter around both the Crow and Blackfeet camps. During a year more than 100 are killed on each side. When the parties are strong, severe battles take place and 50 to 100 are killed on each side if they are pursued and overtaken. But they often get away with the horses free of loss; particularly in the summer season when the trail cannot be followed fast, or when large war parties make a descent on small camps. Whatever losses in horses the Crows sustain, they are supplied by yearly peregrinations to the Flat Heads and Nez Percés with whom they exchange guns, blankets, etc., the produce of their robes and furs, for these animals. On their return the same scenes are enacted over again. The Blackfeet, being four times more numerous than the Crows, gain by these expeditions.[13] The latter are gradually becoming weaker in men from this and other causes. The Assiniboines supply themselves with horses by stealing from the Blackfeet, and the Sioux in their turn take them from the Assiniboines. Thus the poor animals are run from one nation to another, frequently in this way returning to their original owner several times. This, with the chase of buffalo and travel of the camp, packing meat, etc., soon wears the beasts out. The Crows value their horses from $60 to $100 each, and those of the Blackfeet can be obtained for from $20 to $60 in merchandise.

It is thought best to be somewhat lengthy and particular about these animals in this history, as it will go far to explain one of the principal causes of perpetual warfare existing among the tribes, which is destined to lead to their entire extinction. Without horses Indians cannot support their families by a hunter's life. They must have them or starve. Tribes who have few must furnish themselves from those who have many, and smaller nations become so reduced in number by the frequency of these expeditions as to fall an easy prey to the larger ones. This is now the case with the Crows who, 'tho brave enough, can scarcely protect what animals they have, much less go in quest of others from their enemies. They do it, however, and consequently are becoming gradually thinned.

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[13] Denig probably classed the Atsina with the three Blackfoot tribes in his comparative computation of Crow-Blackfoot populations. Still his proportion seems exaggerated. Vaughan, who considered the Atsina part of the "Blackfeet Nation" estimated its total population at 1,175 lodges in 1858, roughly 2½ times Denig's Crow estimate of 1856 (Ann. Rep. Comm. Ind. Aff., 1858, p. 432).

SOME CHARACTERISTICS OF THE CROW INDIANS

This tribe has strongly marked national features, differing in some respects greatly from any other. Their general character is peaceable toward Whites. They are not ever very bloodthirsty toward their enemies, except in case of immediate revenge for the loss of some of their people. One excellent trait in their character is that, if possible, in battle they take the women and children prisoners, instead of dashing their brains out as the rest of the tribes do. They and their friends and brethren (the Gros Ventres) are the only nations we know who exhibit this mark of humanity.

About 12 years ago in a great battle with the Blackfeet in which the Crows killed all the men of 45 lodges of the former, they also took 150 women and children prisoners. These they did not even use harshly. The women were made to work like their own wives—perhaps a little more—'tho not abused. The children were adopted into their own families, have grown up, and are now as much Crow as those of their own producing.[14] It is also worthy of remark that the women, after a year's residence, and understanding some of the language, will not return to their people when given their liberty. This speaks volumes in favor of the Crows, proving how much better they are with strangers than with their own friends. The male children become Crow warriors, and carry the tomahawk and scalping knife against their relations, often murdering their own fathers or brothers without knowledge or remorse. The loss of a male child or a warrior is always a great misfortune with Indians. It is one less to defend the camp or to hunt. Therefore, in thus raising the children of their enemies, they in a manner supply the loss of a portion killed in war. These children are not always adopted as sons or daughters of those who capture them. This only happens when those who have taken them have recently lost by sickness some of their own children, to which the prisoner child is supposed to bear a resemblance.[15] Whether or not this step is taken, they always become attached to them, who as they grow up show much affection and are instructed in the customs of war and the chase the same as others. The children knowing no other parentage except from the descriptions received from their protectors, which are always unfavorable, their feelings, of course, toward their masters are the same as though they were their own parents.

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[14] Denig (1930, pp. 551-552) referred to this action, stating that some 200 women and children were captured, but the Fur Co.'s agent among the Crow was able to return about 50 women to their own people. This doubtless was the battle between the Crow and the Small Robes band of the Piegan in 1845. That severe defeat reduced the Small Robes from a prominent Piegan band to one of minor importance. (See Ewers, 1946.)

[15] Gray-bull, one of Lowie's Crow informants, stated that he had "raised a boy because he looked like one of his own sons, who had died" (Lowie, 1912, p. 219).

The Crows are cunning, active, and very intelligent in everything appertaining to the chase, war, or their own individual bargaining. In all other respects they are in a primitive state of ignorance. They are the most superstitious of all the tribes, and can be made to believe almost any story however improbable if the same is of a superhuman nature. Thus they ascribe powers to Whites, and to their own conjurors, far beyond those admitted by any other nation. Residing as they have and still do in the isolated regions of the Rocky Mountains, they have not had the opportunity to improve themselves in any branch of knowledge, even in the most simple things, that those who reside on the Missouri have. They seldom see any white persons in their own country except the fur traders, who are with them part of the winter and who only attract their attention to matters relating to the trade. Surrounded by hostile and powerful tribes, they have not until late years had the advantage of associating with other nations, and from that source gleaning some information concerning the world around them. They may be said to be yet in a state of nature, and but little elevated above the brute creation.

Some of their habits are of so filthy and disgusting a nature as not to admit of being published. In other respects they may be reckoned good. For instance, scarcely an incident has happened during the last 40 years in which they have killed a white man. Even the Rocky Mountain trappers, that desperate set of men who imposed upon and ill-treated them on all occasions, were suffered to trap their country of beaver without molestation. Not that they feared them, for these trappers were scattered through their district in small parties, which could at any time be cut off without loss, but by some natural formation of their disposition, they would not kill them and seldom robbed them. This is the more singular when we reflect that inveterate war was kept up between these trappers and all other nations, in which many were killed on all sides, and which resulted in the Whites abandoning that dangerous business. While the Assiniboines, Sioux, Blackfeet, Crees, and all have murdered Whites at different times, the Crow Nation can step forward and declare themselves unpolluted by their blood.

Another thing equally strange is that such a savage nation, living without any law and but little domestic regulation of any kind, should be able to settle all their individual quarrels with each other without bloodshed, while yearly brawls and murders take place among the rest of the tribes. In the space of 12 years but one Crow Indian has been killed by his own people. The cause of this was: An Indian struck another's wife across the face with his whip, upon which the husband stabbed him on the spot. The relations of the deceased armed to kill the other. But his friends protected him till dark, when he fled to the Snake Indians, with whom he resided 12 years. Then, thinking the affair blown over, he returned to his own people. But the old grudge was renewed, and he was obliged to leave the second time, with the intimation that should he again return he would be killed. Since that time he has not been heard from. Though this is the case, and they do not kill or strike each other, yet we must not infer therefrom that no quarrels take place. On the contrary, differences arise more frequently among them than among others who carry quarrels to extremes, because, where the penalty of offense is death, persons are more circumspect in their behavior. But the Crows settle all disputes by abuse and taking each other's horses. Thus, if an Indian elopes with another's wife, the unfortunate husband will seize upon the whole of the offender's horses. Should he have none, then he takes those of his relations. In this he has the support not only of his own relations, but of the greater part of the camp. Now an action of this kind would be death to the offender with all other nations, besides taking a good deal of his property.

When retaliation is made by taking horses, the person who has committed the offense keeps the woman, and in the course of time his relations buy back his horses from the other. Any crime or misdemeanor can be paid for among the Crows except murder. Even should this happen, we feel convinced that their fondness for horses would overrule their disposition to revenge, and that a reasonable number of these animals given to the friends of the deceased would settle the affair. Any large thefts, and all disputes concerning women, are arranged on this system.[16]

Smaller pilferings and discord are decided by heartily abusing each other. At this game both men and women are equally adept, and their language affords a fine variety of beautiful epithets, which they bestow upon each other in great profusion. Most of these expressions consist of comparing the visage and person thus abused to the most disgusting objects in nature, even to things not known in the natural world. Or they likewise cast in each other's teeth the poverty of themselves or their relatives.[17] The men are as bad as the women on these occasions, though men when angry usually commence relating their brave actions, count each coup distinctly on their fingers, calling on their antagonist to do the same and show which is the bravest man. In the course of a dispute of this kind the lie is given many times, which attracts no further notice than sending the like back with the addition of coward, thief, etc. In this way also whole bands abuse each other. The band of the Platte sometimes takes offense at the band along the Yellowstone. Every traveler that comes from one to the other during 1, or sometimes 2 years, brings threats, abuse, and defiance. One who did not know them would think that in case the bands met a desperate struggle would take place. Nevertheless when they meet, after all this parade of threats, they are the most peaceable people in existence. They will remain together for months on good terms. But when they separate, and have a river between them, so that no harm can be done, their war commences and terrible is the abuse shouted across the stream, accompanied by throwing stones that do not reach halfway, or shooting in the air with powder. This kind of conflict is often kept up for a day or two. Then they go different directions, swearing vengeance at their next meeting.

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[16] A half-century earlier Larocque noted that quarrels among the Crow generally were settled through gifts of horses or guns to the offended persons, "but there happen few quarrels, and they are generally occasioned by their wives and jealousy" (Larocque, 1910, pp. 58, 61).

[17] Lowie found that songs "composed in derision of someone that had transgressed the rules of propriety, or in revenge for some personal or group affront, seem to have figured prominently in Crow society . . . Similar punishment was meted out by jilted lovers, and by one of the three local groups, when affronted by one of the others" (Lowie, 1912, p. 245).

These people also are remarkable for never being the first to break a peace between them and other nations. They have at several periods been on friendly terms with the Assiniboines, Flatheads, Arikaras, Arappahoes, Cheyennes, Snakes, and other tribes. Whenever these transient peaces were interrupted, it was done by the others.

Having now enumerated some of their good qualities it is time we should refer to other traits not so amiable. In the first place they are beggarly and troublesome, particularly the young men, women, and children. When camped around a fort or wintering houses they fill up every place, torment all the domestic animals, and steal everything they can lay their hands on. The men are bold and impudent, particularly the warrior class. The women are noisy, thievish. Neither have the least idea of decency or decorum. The bucks make it their whole business night and day to run after the women, who, whether married or not, appear to be perfectly unaware that virtue or chastity has any existence even in the imagination. Their conduct in these matters is carried on in broad daylight without any regard to bystanders or lookers on. Indeed it would appear that they are as destitute of the ideas of decency or modesty as any part of the brute creation, for they prefer to be seen rather than to conceal any and all transactions between the sexes. No disgrace or penalty being attached to deceiving young women, contrary to the customs of other tribes, the ruining of a woman's character appears to be lightly if at all considered; it must follow that virtue is at a very low ebb among them. The consequence of this promiscuous and illicit intercourse is that disease more or less runs through the whole nation. Another effect is that a superfluous number of unmarried women are to be found, and those who are married are neglected by their husbands who run after the rest. The married women are not a whit better than the others as they usually have had more or less connection before they were taken as wives by any one man. Before marriage a woman is not thought imprudent if she has but one lover; more, however, stamps her character as a courtesan. Consequently if such a thing as an honest woman can be found in this tribe it is one who has been raised under the husband's own care from a child, and taken for a wife at the age of 10 to 13 years.[18]

The old men, chiefs, and councilors are more decorous in their behavior as regards certain matters in which women are concerned. Neither are they so impudent and forward as the young men. But they make it up in begging any and everything they think likely to be had. In their camp this system of begging is changed to borrowing articles which they invariably forget to return. The stealing of property is mostly confined to the old women who are capital hands at it. Sometimes small things such as knives, ornaments, and utensils are abstracted. But in a large camp where all are compelled to leave their buffalo hides outside their lodges for want of room, several hundred of these and other skins are stolen from each other during a winter. About a fort they find good picking—tin cups, knives, spoons, articles of clothing, tools, etc., disappear with remarkable rapidity. They are so adroitly taken even before the eyes of the owner as always to escape detection. Larger items such as guns and horses they do not steal, either from the Whites or from each other. Frauds of this kind could not be concealed and the owner would take his property. Among kindred, however, these Indians show some liberality. If a man has all his horses stolen or killed, he can generally find friends to give him others, 'tho the giver expects payment when the receiver shall have retrieved his losses, or to be paid in some other way. Situated as they are in the constant fear of enemies, and liable at any time to lose their whole stock of animals, custom has pointed out the above plan to secure to them as far as may be the means to obtain a living. However much they may like their horses, or dislike to part with them, yet each man feels he depends on his neighbor for support when they are taken off. This happens so often as to render an understanding of this kind not only desirable, but absolutely necessary to their national existence; so that what appears at first sight to be a liberal and kind action is only one of interested principle.

The men and women are troublesome enough in many things, but the greatest nuisance in creation is Crow children, boys from the ages of 9 to 14 years. These are left to do just as they please. They torment their parents and everyone else, do all kinds of mischief without either correction or reprimand. In other nations these small fry are kept out of sight where men are, but the parents of this nation place them before themselves in every crowd or assembly, or in their own families. Thus they become intolerable, and a few years after ripen into the bold, forward, impudent young men before mentioned.

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[18] In 1833 Maximilian noted, "Of the female sex, it is said of the Crows, that they, with the women of the Arikkaras, are the most dissolute of all the tribes of the Missouri" (Maximilian, 1906, vol. 22, p. 354). Lowie found Crow "mythology, the reminiscences of informants, and ancient songs are all surcharged with evidence of the tendency to apparently unlimited philandering" (Lowie, 1917, p. 78).

The male grown portion of the Crows are decidedly prepossessing in their appearance. The warrior class is perhaps the handsomest body of Indians in North America.[19] They are all tall, straight, well formed, with bold, fierce eyes, and as usual good teeth. These also dress elegantly and expensively. A single dress often brings the value of two, three, or four horses. The men of this age are neat and clean in their persons, fond of dress and decoration, wear a profusion of ornaments and have different dresses suitable for different occasions. They wear their hair long, that is, it is separated into plaits to which other hair is attached with gum, and hangs down their backs to several feet in length in a broad flat mass which is tied at the end and spotted over with white clay. A small portion in front is cut short and made to stand upright. On each side of the head hang frontlets made of beads or shells, and alongside each ear is suspended several inches of wampum. Their faces on ordinary occasions are painted red, varied with a tinge of yellow on the eyelids. In large slits through the ears are tied sea shells cut into angular shapes, which are of a changeable blue and green color. These shells find their way from the coast of California through the different nations until handed to the Crows in exchange for other property.

As we do not wish to lose sight of the order of our history and are obliged in this place to confine ourselves to general description, the different dresses worn by these people on the occasions of their various ceremonies will be described when we come to treat of their manners and customs. It is sufficient here to state that the Crow men, as far as outward appearance goes, are much the finest looking of all the tribes.

It would seem that nature on this occasion has done so much in favor of the Crow men that she entirely neglected the women. Of all the horrid looking objects in the shape of human beings these women are the most so. Bad features and worse shapes, filthy habits, dresses and persons smeared with dirt and grease, hair cut short and full of vermin, faces daubed over with their own blood in mourning for dead relations, and fingers cut off so that scarcely a whole hand is to be found among them, are the principal things that attract the attention of the observer. The young women are hard, coarse-featured, sneaky looking, with sharp, small noses, thick lips, red eyelids caused by the venereal disease, and bare arms clothed with a coat of black dirt so ground in as to form a portion of the skin. The old hags can be compared to nothing but witches or demons. Some of them are of monstrous size, weighing 250 to 300 pounds, with naked breasts hanging halfway down to their knees. Being always in mourning for some dead relations, they are usually seen in old skin dresses, barelegged, hair cut short, and their faces smeared over with white clay and blood. Notwithstanding all this, some of them have very handsome dresses which they wear on several occasions and which will be referred to, though they pay but little attention to dress of any kind in their ordinary everyday life. It would appear singular that such handsome men would be satisfied with such ugly women, but they do not seem to have the same idea of female beauty as we have. If a woman be young and not absolutely deformed, one appears to be as desirable for them as another.[20]

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[19] George Catlin, the artist, considered Crow men "really a handsome and well formed set of men as can be seen in any part of the world." He described the faces of "the greater part of the men" as "strongly marked with a bold and prominent antiangular nose, with a clear and rounded arch, and a low receding forehead" (Catlin, 1841, vol. 1, pp. 49, 193). Catlin's portrait of the Crow chief, Two Crows, painted at Fort Union in 1832, illustrates this facial profile. (See pl. 3.)

About one-half the nation have a plurality of wives, the rest only one each.[21] The property of husband and wife is separate. Each has a share of horses, merchandise, and ornaments. Not being accustomed to depend much on each other's fidelity they wisely prepare for immediate separation in the event of any great domestic quarrel. When from certain causes they decide on parting, the husband takes charge of all male children unless they are too small to leave the mother; the female part go with the wife. Guns, bows, ammunition, and all implements of war and the chase belong to the man; while kettles, pans, hides, and other baggage of the like nature fall to the woman's share. The lodge is hers, and the horses and other property having been divided perhaps years before in anticipation of this event, each has no difficulty in selecting their own. From this state of things it must follow that differences often arise as to what kind of merchandise shall be bought with the proceeds of their winter's hunt. She maneuvers to get such articles as would finally become hers, and he works for his advantage. In these differences, where considerable affection exists between the parties, the woman usually gains the point. At other times the skins are divided previous to selling and either trades what they like best. They exhibit great fondness for their children. Whatever they cry for they must have.

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[20] The artists Catlin and Kurz shared Denig's opinion of the appearance of Crow women. Catlin (1841, vol. 1, p. 50) wrote, "The Crow women . . . are not handsome." Kurz (1937, p. 184) stated, "women of the Crow tribe are known rather more for their industry and skilled work than for beauty of face and form." Catlin's painting, reproduced as plate 4, is the earliest known portrait of a Crow Indian woman.

[21] Of Crow polygamy Larocque observed, "some of them [men] have 8 or 11 and 12 [wives], but in such cases they do not all live with him, some are young girls that are only betrusted. But by far the greatest part have only 2 or 3 wives; some have only one, and those reason upon the folly of those that take many wives" (Larocque, 1910, p. 57).

When sick, no expense is spared for the services of the medicine men, and in death they evince every feeling of deep-felt grief. When anyone dies the immediate relatives each cut off a joint of a finger. This is done by placing an ax or butcher knife on the joint, and striking the same with a good-sized stick. Occasionally, in a high state of excitement, they lay their finger on a block and chop it off with a knife held in the other hand. The blow often misses the joint and the finger is divided between joints, which takes a long time to heal and leaves a portion of the bone protruding which presents a very disagreeable appearance. Both men and women mutilate their hands in this manner, so that at the present day there is scarcely an entire hand among them. The men, however, reserve entire the thumb and forefinger of the left hand, and thumb and two fingers of the right, so that they can hold a gun or draw a bow. But even these fingers often want a joint or so when all the others are cut off to the stump. They never tie up these sores, but after daubing over their faces with the blood, hold a bunch of wild sage on the stump until it stops bleeding. The blood is never washed off their faces, but let dry there and wear off, and when it is no more to be seen they cut their legs to obtain it and renew the application.[22] The hair is also sacrificed on these occasions, either cut short or torn away by handfuls. In this state the mourner goes about on the hills howling dismally every day or so for a year or more, clothed with an old skin, bare feet and legs, wading through snow or mud, and crying until they are so hoarse as not to be heard.

When the camp is on the move in the summer, this tribe presents a gay and lively appearance, more so perhaps than any other. On these occasions both men and women dress in their best clothes. Their numerous horses are decked out with highly ornamented saddles and bridles of their own making, scarlet collars and housings with feathers on their horse's heads and tails. The warriors wear their richly garnished shirts, fringed with human hair and ermine, leggings of the same, and headdresses of various kinds, strange, gay, and costly. Any and all kinds of bright-colored blankets, loaded with beads worked curiously and elegantly across them, with scarlet leggings, form the principal portion of the dresses of the young men or those whose feats at war have not yet entitled them to the distinguished privilege of wearing hair. These bucks are fancifully painted on the face, their hair arranged as has been described, with heavy and costly appendages of shells, beads, and wampum, to the ears and around the neck. The women have scarlet or blue cloth dresses, others white cotillions made of the dressed skins of the bighorn sheep, which are covered across the breast and back with rows of elk teeth and sea shells. These frocks are fringed along the side and round the bottom. The fringes are wrought with porcupine quills and feathers of many colors. The price of the elk teeth alone is 100 for a good horse or in money the value of $50. A frock is not complete unless it has 300 elk teeth, which, with the other shells, skin, etc., could not be bought for less than $200. When traveling, the women carry to the horn of the saddle the warrior's medicine bag, and shield. His sword, if he has one, is tied along the side and hangs down. The man takes charge of his gun and accoutrements in readiness for any attack however sudden. The baggage is all packed on the horses, at which they are very expert. Kettles, pots, pans, etc., have each their sack with cords attached. These are on the sides of the animal, and on top of the saddle is either one large child fit to guide the horse, or two or three small children so enveloped and well tied as to be in no danger of falling.[23] Often the heads of children are seen popping up alongside of pup dogs or cub bears on the same horse. The lodge occupies one horse and the poles another. The meat and other provisions are put up in bales well secured. They are so expeditious in packing that after their horses are caught they are saddled, the tents struck, everything put on the horses and on the march in less than 20 minutes. The great number and good quality of their horses make a showy appearance. Both men and women are capital riders. The young men take this occasion to show off their persons and horsemanship to the women. A good deal in the way of courting is also done when traveling. The train is several miles in length, wives are separated from their husbands, daughters at some distance from their mothers, which opportunities are not lost by these young and enterprising courtiers. They ride up alongside, make love, false promises, in short use any and all means to obtain their end.

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[22] Zenas Leonard (1904, pp. 271–272) witnessed self-mutilation by scarification and amputation of portions of fingers by relatives of Crow Indians killed in a battle with the Blackfoot, November 21, 1834. He saw that males preserved "the first two fingers of the right hand . . . for the purpose of bending the bow and many of the aged females may be seen with the end off each of their fingers, and some have even taken off the second crop." Denig (1930, pp. 427–428) has another description of Crow self-mutilation.

When on the march they move rapidly and when pressed for meat to eat, still more so. On these occasions they go on a fast trot, sometimes at a gallop, making from 20 to 40 miles a day. Generally, however, their encampments are from 10 to 15 miles.[24] It is often a strange and barbarous sight to see small children but a few days old tied to a piece of bark or wood and hung to the saddle bow which flies up at each jump of the horse when on the gallop, their heads exposed to hot sun or cold. This does not appear to hurt them in the least. At sunset the cavalcade stops. The spot for each lodge is cleaned away and in the space of a few minutes the lodges are set up, the horses turned out to graze, and each family has a kettle of meat on the fire.

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[23] Larocque (1910, p. 64) noticed that Crow children too young to ride alone were tied in the saddle when camp was moved. About two decades later Gordon wrote of Crow children, "At four or five years of age they will ride alone and guide the horse" (Gordon *in* Chardon, 1932, appendix E).

Owing to their having good animals and plenty of them the Crows seldom suffer for want of meat as is the case with some tribes who are not so well furnished with horses. They can move camp at any time and go in quest of buffalo, should there be none in the neighborhood. They have little else to eat but meat. Their country produces a few wild cherries, plums, and service berries, together with some esculent roots. But none of these are collected in sufficient quantities to form a resource in time of need, and as they do not cultivate, they depend entirely on the chase for subsistence.

They are good buffalo hunters on horseback with the bow and arrow, seldom using the gun for hunting except on foot when the snow is too deep for horses to catch the buffalo. They are not so good on foot as the Crees and Assiniboines, who, having few horses, have more practice in this manner of hunting.[25] They can kill elk and bighorn with their shot guns but are far behind the other nations named in this respect. They do not manage their hunts as the other tribes do. They have no soldiers' lodge to regulate the hunts.[26] Each man goes out with whoever chooses to follow. Sometimes nearly the whole camp turns out to one surround, and again but few. When many hunt together several hundred buffalo are killed, the meat and hides divided, and all return packing the same on their horses. There are no poor people among this nation. That is, there are none so destitute of means that they cannot go or send to the hunt and get a supply of meat. In this respect they are much better off than some of the neighboring tribes. Another remarkably good trait in their character is, they do not suffer the aged and infirm to be left behind and perish as is the custom with some other nations, but this can be accounted for from the fact of their having the means to transport them while the others have not.[27] Neither is meat ever so rare with the Crows as with the Assiniboines.

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[24] Probably the best description of daily movements of any nomadic tribe of the Northern Plains in buffalo days appears in Larocque's journal of his trip with the Crow from the Hidatsa villages on the Missouri to the Yellowstone River near present Billings, Mont., via the eastern base of the Big Horn Mountains, from June to September 1805. Analysis of his data (Larocque, 1910) shows that camp was moved on 47 of 76 days en route. Daily movements ranged from 3 to 24 miles. The median distance traveled on the days camp was moved was 9½ miles. Generally they followed stream courses. There was no mention of any dry overnight camp. On several days rain caused a late start or early stop. Delays of a day or more were caused by inclement weather (rain), serious illness in camp, halts to hunt (although hunting parties generally were out while camp moved), to dry meat and dress hides following a concentrated hunt and to dry bison tongues for the forthcoming late summer ceremonial, to cut ash whips, to hold a council to determine the route to be followed following a disagreement among the leaders, to wait in readiness while scouts reconnoitered for signs of enemies feared to be in the vicinity. They also stopped for a day when good pasture was reached to permit their horses to feed and rest after 2 days of long marches across barren country.

[25] In 1805 Larocque found the Crow to be "excellent marks men with the bows & arrows but poor shots with the gun." He also reported "They say that no equal number of other Indians can beat them on horseback, but that on foot they are not capable to cope with those nations who have no horses" (Larocque, 1910, pp. 65, 66).

[26] This statement is contrary to the observations of Larocque, "The hunting matches are regulated by a band of Young men who have much authority causing them to encamp or flit at their pleasure tell them where there are Buffaloes & to go hunting. They prevent them from setting out after one another and make those that are first ready wait for the others so that they may all go together and have an equal chance. Those that behave refractory to their orders are punished by a beating or their arms are broken or their tents cut to pieces" (Larocque, 1910, p. 60). Leonard also witnessed strict regulation of the hunt by Crow police in 1834 (Leonard, 1904, p. 257).

BIOGRAPHY OF CHIEF ROTTEN BELLY

Some warriors have arisen among the Crows who displayed much generalship in conducting different expeditions against their enemies. Among the foremost of these can be classed Rotten Belly, who flourished about 20 years since, 'tho he is now dead. Had this man had the same opportunities of action he would undoubtedly have ranked with Tecumseh or Pontiac, but as his operations were confined to petty attacks on the hostile nations on their borders, and as he had but a small number to command, his friends must be contented with this small tribute to his memory.

When a very young man he commenced his career of war in going out at the head of small parties and bringing home horses from the Cheyennes, Arapahoes, Panacks, Sioux, and Blackfeet. In these expeditions he was generally successful, taking large herds of horses and bringing his own party safe to camp. This is the principal aim of a leader, for if in stealing the horses he had had some of his people killed no credit would follow the feat. On many occasions, however, he was followed and overtaken by his enemies. These were the times in which he proved himself able to command. He had taken all precautionary measures, picked his men, had them well armed, the weapons in good order, and always retreated with his booty in a direction where timber was near in which to take shelter in case of attack. When escape was impossible he forted with wood and stones and gave battle. Frequent were the skirmishes he had with his foes in this way. But fortune favored him. At every sally he either brought home their scalps or horses and always without losing any of his party. At the age of 30 he was chief of the Crow Nation.

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[27] "I saw more cripples and decrepid old men among them than among any other nation except the Big Bellys and the Mandans. It is said the Sauteurs and Kinistenaux tribes send their enfirms and old to Kingdome Come to ease themselves of the trouble of attending the care of them. These Nations, however, do it not, their old and infirm are of very little trouble to them. The Mandans and Big Bellies are sedentary and the Rocky Mountain Indians (Crows) have so many horses, that they can transport their sick without trouble. Whether they did it not before they had horses I do not know" (Larocque, 1910, p. 57).

Other things aided this man on his road to the chieftainship. He had large and rich connections, was considered a prophet or medicine man, one who could obtain supernatural aid in his operations. He made no show of his medicine, no parade of sacrifices, or smokings, no songs or ceremonies, but silently and alone he prayed to the thunder for assistance. In his general conduct he was not an agreeable man, but rather of a quiet, surly disposition. He spoke but little, but that in a tone of command. His great superiority over others consisted in decision, action, and an utter disregard for the safety of his own person.

When acknowledged as the only chief of the whole nation he enacted many good laws and rules for their preservation, led the camp with judgment, choosing places where game was plentiful, and the country suitable for their animals and defense. He caused them to trade more guns and ammunition, established regular camp sentinels night and day, and used such vigilance that during his life the hostile neighbors could make no headway either against his people or their animals. Whoever approached the camp was killed. Warriors were on the alert and well prepared.

When arrived at the sole command he left off heading small parties and carried war into their enemies' country on a large scale. The first grand battle was with about 80 lodges of the Blackfeet on Muscleshell River. Rotten Belly had his spies out watching movements of this camp for months beforehand, and having collected the whole Crow Nation maneuvered them in such a way as not to raise the suspicion of their enemies. He appeared to be marching out of their country when in reality he was encircling them. His wish was to come upon them on some plain, and take them unprepared.

When by his runners he knew that the time and situation were favorable to his views, he, by forced marches, placed his camp near them without being discovered. Under cover of the night about 400 warriors placed themselves still closer. Early in the day when their enemy's camp was on the move, scattered over a level plain of some miles in extent, he gave the word to charge. Terrible was the storm that swept over the Blackfeet. The Crows were well armed, mounted, and prepared, the others embarrassed with their women, children, and baggage. Their long and weak line of march was literally, "rubbed out" by their savage foes. Whoever endeavored to defend was killed, the women and children taken prisoners. Most of the men of the Blackfeet were in front of the traveling van. They soon rallied and returned the charge but were outnumbered. Although they fought bravely for some time they soon were obliged to leave their families and seek safety in flight. Others died defending their children. In the end, after a severe battle of a few hours, 100 and upwards of the Blackfeet lay dead on the field. Two hundred and thirty women and children were taken prisoners and more than 500 head of horses fell to the share of the Crows, besides all the lodges, camp equipment, provisions, etc. The Crows lost 22 men in this battle, besides others badly wounded. But upon the whole it was a great victory for these wild tribes who seldom have an opportunity to do half that much. They did not scalp half their enemies, there were too many and they tired of the employment. But few men of this small camp of Blackfeet escaped. The male children taken were brought up to be Crow warriors, and the females to be the wives of their captors with the view of repairing the former losses of these people in their constant wars with neighboring tribes.

Although others besides Rotten Belly distinguished themselves on this occasion, yet he being the leader received the greater share of applause. Others counted individual coups. he the aggregate. His name was sung through all the camps for months. His lodge was painted with rude drawings of the fight, he being the principal figure. The scalps, after having been danced, were suspended from his lodge poles. His shirt, leggings, even his buffalo robe were fringed with the hair of his enemies—the last being the most distinguished mark that can be borne on the dress of a warrior, and one never used but by him who has killed as many enemies as to make a robe with their scalps.

It seldom happens in human affairs but that when the height of prosperity is reached some reverse follows. Too confident in their own powers and elated with their victory, contrary to the advice of their leader, the nation divided into several camps. They again, having once lost sight of their general and acknowledged head, divided into smaller parties, each moving in a different direction for hunting purposes. It had also been the custom of these Indians every year or two to visit other nations in and across the mountains for the purposes of trade and barter as has been mentioned. Sometimes they pushed their way as far as the Kiowas and Comanches and occasionally near the Spanish settlements of Taos and Santa Fe. In these travels they encountered some tribes with whom they were at peace but always rendered themselves liable to be cut off by larger nations considered enemies. At all events the profit ensuing from these adventures in horses, ornaments, etc., either bought of the one or stolen from the other, was sufficient inducement to make the attempt. They are a bold and active people and do not calculate much the danger when the expedition is likely to prove advantageous.

At the time above mentioned, when the Crows had separated into small parties for the purposes mentioned, a portion consisting of 30 lodges or upward placed their camp on the headwaters of the river Cheyenne beyond the first spurs of the Rocky Mountains called the Black Hills. The Cheyennes, a hostile nation from whom the river takes its name, had in a great measure abandoned that part of the country for several years before and moved on the South Fork of Platte River. Here, after remaining some time they suffered considerably from war parties of Comanches and were obliged to move back to their old district a little before the time the small body of Crows undertook their journey through it. The Cheyennes numbered at that time about 300 lodges, were rich in horses, good warriors, and perhaps the best horsemen in the world. Perceiving the approach of their enemies they lay in ambush for them, attacked them in the night, and massacred nearly the whole. Some few men escaped in the darkness to carry the sad intelligence to their people, but the rest, men, women, and children, were indiscriminately put to death. The few captives taken, whether male or female, young or old, were rereserved for torture which was inflicted upon them in every possible way their savage natures could suggest.

In the course of a week or two those who fled reached some of the camps of their own people, who sent others in quest of the different portions of the nation scattered far and wide. Their principal aim now was to hunt up their chief, Rotten Belly, and request him once more to be their leader to revenge. He was then with the Flatheads, but these people travel fast and such was their haste to collect their forces that in a month's time they had all rendezvoused in their own country with their chief at their head ready to start on the war path.

The Crow camp on this occasion presented a grand and imposing appearance. They were all ordered to parade with their arms and accoutrements ready for the inspection of their chief. As at these times distinctions of rank are observed, each warrior wore those decorations which indicated his standing among his people. The general command of the whole devolved upon Rotten Belly, but other chiefs also are deserving of notice, such as Long Hair, the Little White Bear, Yellow Belly, Two Face, etc., each of whom had under his immediate command a large band of followers. These minor chiefs composed the Council of Rotten Belly, all being well versed in the art of Indian warfare besides having given proofs of their skill and bravery on many occasions under the eye of their head chief. The whole number of warriors thus assembled was about 600, or about one-fourth of the whole nation able to bear arms. They were also picked men, not young beginners but persons who had struck enemies, headed war parties, and given other evidences of their willingness and ability in the hour of danger. All these were mounted on fast-running horses with splendid trappings. Their dresses were of the most gay and costly description, their arms in the very best order, and their faces painted in the usual manner when starting on hazardous excursions. Clan after clan passed in review before the chief, whose keen eyes were directed to their arms and animals, occasionally finding some fault with one or detecting some defect in another which was directed to be remedied. The chief on parades of this description, or indeed on all public ceremonies, wore his whole insignia on different parts of his person and his horse. His war eagle bonnet reached from his head to the ground even when he was mounted on his tall and powerful war horse. His robe and dress were everywhere fringed with the scalp hair of his enemies. Where this was wanting the beholder was reminded of his rank by rude drawings explanatory of some of his bravest achievements at war. Very little noise accompanied this display of his troops. The cry of mourners for their lately killed relatives rang strange and wildly through the valley, and a gloomy, stern resolve was depicted on the faces of all the warriors. One sole idea, one mind, and one intent reigned, which was that of speedy and terrible revenge.

After all had been thoroughly examined, approved, and enlisted, the chief called the head men in council, where, in a few words, he explained to them his decison and plan of action. This was to leave the camp where it then was, take the force he had aroused and pursue the Cheyennes until he found them, even into the heart of New Mexico. He took a solemn oath, in which he was joined by the whole council, never to return until they had taken full revenge for the loss of their friends. The substance of this decision was harangued through the camp, 2 days given for preparation, and on the third the whole party above described were moving rapidly toward the country of the Cheyennes.

It is not our design to follow this party by describing each day's march. It will be sufficient to state that they proceeded with great caution, which, with a correct knowledge of the country, enabled them to proceed without discovery. When near the place where their enemies were supposed to be, most traveling was done during the night, the party resting themselves and their animals in the daytime. Scouts were thrown several miles who inspected the foreground and conveyed intelligence to the main body behind to move forward. Not a foot of land was traveled over that had not undergone the scrutiny of the discoverers for hours from the neighboring hills. Much time was wasted in this way in order to take their enemies unprepared, for after arriving at the place where the battle had been fought they found the Cheyennes had fled with their camp some days previous. The trail made by a tolerably large camp is not difficult to follow. The chief therefore could calculate with some degree of certainty how far they might be in advance and the time required to overtake them. Having with this view examined their late encampment and pointed out to his followers the different signs indicating the above intelligence, they proceeded to collect the human skulls and bones, which they judged very correctly to have once belonged to living persons of their own nation, being those that had been massacred. After crying over them, cutting themselves, and making promises to their spirits to take ample revenge, they dug large holes and interred them. This is contrary to their usual custom. Dead bodies are usually enveloped and placed in trees. But as these were but the bones and no other way of disposing of them presented itself, they used this method to secure even these poor remains from further insult by passing enemies.

A grand speech was made over these ceremonies in which the chief artfully stirred up the spirit of his followers to a pitch of revenge bordering on desperation. Their vows were renewed, arms examined and at once the march was resumed more rapidly.

In about 10 days after this occurrence they found themselves in the valley watered by the Arkansas where they saw such fresh indications of the Cheyennes being at hand as induced Rotten Belly to proceed with great caution, having his best spies out in all directions. These soon brought certain information of their enemies' camp, having approached it in the night and made a correct examination of its locality. The next night they were stationed along two creeks between which the Cheyennes had placed their lodges. The Crows were concealed in the valley of the creeks among the wood and timber and at the distance of a mile from the camp, presenting an extended line on each side of men ranged from 10 to 20 paces apart. One detachment was headed by Rotten Belly and the other by the Little White Bear. Early in the morning, or as soon as day broke, seven Crows were sent down each creek who, running between the Cheyennes' horses and their lodges, drove all the animals slowly in the direction of the main body of their people who lay in ambush. The Cheyennes perceiving but few persons taking away all their horses gave chase on foot at different distances as they could arm and run. Thus some 60 to 80 persons, the principal warrors of the camp, were led between the files who simultaneously raised the war whoop and encircled them. Of these not one escaped. There was but one rush, one discharge of arms and arrows, and the whole lay dead. Others now sallied out from the camp and were likewise cut off in detail. But few remained in the lodges. These were charged upon—some absconded but all males met with were put to death. The result of the whole was a complete victory on the part of the Crows. Upward of 200 enemies were killed, 270 women and children were taken prisoners. More than 1,000 horses, besides all the camp baggage, merchandise, and ornaments, were divided among the Crows. Their loss on this occasion was but 5 men killed and some 10 or 15 wounded. The object of the expedition having been accomplished, the party traveled back to their own people elated with victory and satisfied with revenge.[28]

The above circumstance brings up the life of the Crow chief to the year 1833, at which time the whole Crow Nation might number 800 lodges, which, averaging 8 persons to each tent would make about 6,400 souls. At this period emigration was fast flowing toward Arkansas and each year the trains of movers became more numerous over the fertile plains watered by that river. It so happened that this Crow party on their way home rejoicing came suddenly upon a caravan of emigrants, or rather the advanced guards of the Indians met with some stragglers belonging to the expedition. By the sign of waving their arms imitating the flying of a crow the Whites judged they belonged to that nation and, being aware of their friendly disposition, gave them warning not to approach the wagons as some of the Whites were then lying sick with smallpox. It was with great difficulty they were made to understand the nature of the danger attending their visit to the wagons, and either not believing the tale or not realizing the consequences they soon gathered round the emigrants bargaining for horses and trafficking for other articles. It is but justice to these people to say that on this occasion they used their utmost endeavors to prevent the Indians from receiving the infection. They tried to deal with them at a distance from the sick, but all to no purpose. Before they parted numbers had caught the pestilence. Before they reached their homes the disease commenced making its appearance and when they arrived in camp more than half the party were taken down by it. It is needless to dwell upon the misery, distress, and death that followed. The well-known fatality of the smallpox among savages has been often described. In this case it was the same as with other tribes—about one in six or seven recovered. As soon as possible after the arrival of the warriors the camp broke up into small bands each taking different directions. They scattered through the mountains in the hope of running away from the pestilence. All order was lost. No one pretended to lead or advise. The sick and dead were alike left for the wolves and each family tried to save itself.

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[28] We have found no contemporary account of this battle. However, nearly a century after the event, Lowie collected what he termed a "quasi-historical text" that certainly referred to it. This text told of a small Crow party under Dangling-foot wiped out by the Cheyenne; of Rotten Belly's leadership of the revenge party; of their ambush of the enemy at the junction of a river and killing of more than 100 Cheyenne, with the loss of but 1 Crow Indian. The Crow casualty, it was claimed, was the younger brother of a Crow woman who had disobeyed Rotten Belly's warning not to kill birds and had destroyed a meadow lark en route to the battleground (Lowie, 1935, pp. 230–236). Little Face told Bradley in 1876 of a great Crow victory on the Arkansas under Rotten Belly's leadership, emphasizing also the episode of the killing of a bird by a Crow woman whose relative was killed in the battle (Bradley, 1923, vol. 9, pp. 304–305).

They certainly gained something by this course. At least the infection was not quite so fatal as among stationary tribes. For the rest of the fall and winter the disease continued its ravages but in the ensuing spring it had ceased. Runners were sent through their country from camp to camp and the remnant of the nation was once more assembled near the head of Big Horn River. Terrible was the mourning on this occasion. More than a thousand fingers are said to have been cut off by the relatives of the dead. Out of the 800 lodges counted the previous summer but 360 remained, even these but thinly peopled. From this time they have been slowly on the increase so as to raise about 460 lodges at the present date, 1856. Rotten Belly had escaped the infection altogether. The Little White Bear had recovered, but the ranks of his once proud force of warriors were terribly thinned.[29]

The then-existing state of the nation called aloud for someone to restore them into some order so that they might not fall an easy prey to their old and powerful enemies, the Sioux and Blackfeet. It was at this time that this chief exhibited talents and wisdom seldom met with among savages and deserving the highest praise. He first took a census of all men, women, and children, then counted those able to bear arms, and lastly noted how many adults, both male and female, remained unmarried. These last he counciled to select wives and husbands without loss of time, but to avoid as much as possible connection with kindred. Here the women prisoners of the Cheyennes aided considerably to reorganize families. Some of them escaped during the general confusion consequent to the prevalent disease, and that nation having previously been visited by the smallpox, but few of the prisoners had died. By unremitting exertions, forced marriages, and equal distribution of arms, horses, and other property, this chief succeeded in restoring the nation to something like order. But much remained to be accomplished before they could successfully defend themselves against their powerful and warlike neighbors. He saw that something more was to be done to retrieve their hopes. Some grand attempt must be made to acquire property, arms, ammunition, and other things necessary to their national existence.

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[29] We have found no other reference to a smallpox epidemic among the Crow in the early 1830's. Neither Maximilian, who was on the Upper Missouri in 1833-34, nor Leonard, who was among the Crow in 1834-35, mention such an epidemic. Certainly there was smallpox on the Central Plains among the Pawnee, southeast of the Crow, in 1832 (Catlin, 1841, vol. 2, p. 24). If the Crow contracted the disease at that period they must have been infected by traders or other Indians, rather than by emigrants as Denig claimed. It is known that the Crow suffered little loss during the severe smallpox epidemic on the Upper Missouri in 1837 (Halsey *in* Chardon, 1932, p. 395).

It has always been the custom of these ignorant savages to consider white people the cause of all diseases, even of other evils in which they have no agency or object. They evince a great disposition to lay all blame on Whites, although they deny they are the cause of any good. The difference of habits and occupations, together with the superstitious awe with which all writing, pictures, and books are viewed, suggests to their disordered minds the idea of sorcery and supernatural powers, which they suppose are made subservient to bad ends. This they know would be the case with themselves had they the power to work unseen evil. Now if this be the case in ordinary events, that white people bring on distress, how much more so it must have been in the instance of the smallpox which they could distinctly trace to its origin when they encountered the emigrant train? Indians seldom reason. They act on impulse. Although the Whites referred to had used all means to prevent the pestilence from being communicated to them, yet they only recollected the cause of their present calamity and swore to take revenge on the authors of their misery. This was the prevalent idea stored up by Rotten Belly. But, as has been stated, these Indians are not murderous in their disposition, had heretofore been on the most friendly terms with Whites, and a good many of the head men and councilors were averse to doing any damage to the traders and trappers in the upper country for suffering brought upon them by strangers.

All questions agitated in Indian councils must have unanimous approval to expect a successful result. This the Crow chief well knew. He also was aware that the aforesaid idea of the cause of their misery would fail to produce the desired effect if not supported by some other. It was a long-cherished wish of this leader, and one which his whole life tended to bring about, to rob the American Fur Co.'s fort at the Blackfeet situated near the mouth of Maria River. For this he could give many cogent arguments likely to obtain universal consent. The Blackfeet were their enemies, and that fort supplied them in guns, ammunition, knives, and other implements of war. That nation also had killed many white people, and those who dealt with them as friends after losing so many of their own color deserved no better fate than the Blackfeet. It was also urged that all war parties passing by the fort to the Crows were furnished with ammunition and that most of the Crow horses stolen by their enemies were purchased at the fort on their return. Another thing was that in their present reduced state they were unable to cope with the Blackfeet. Their arms had mostly been buried with their dead owners. They had but little ammunition. Numbers of their horses had been killed, lost, strayed, and stolen during their prostration by disease. They had in fact but little property of any kind. They were scarcely able to support themselves, much less to defend against a powerful nation. All these views were advanced by the chief in full council and many other arguments added showing that a stroke of this kind, if successful, would retrieve their losses, ruin their enemies, and revenge themselves on the Whites—the primary cause of their present feeble condition. It was a popular measure and received the approval of the entire nation. But it was also firmly put forward by the other chiefs that, although they would help themselves to the property in the fort, yet they would not consent to killing the people therein. The result of their deliberations was that they would lay siege to the fort and compel the traders to evacuate, afterwards share the plunder, which at that time amounted to 15 or 20 thousand dollars of arms and other articles suitable for the purposes of hunting and war, besides large quantities of provisions, clothing, etc.

This being decided upon, the Little White Bear was ordered to go forward with a party of 30 men and examine the country while the rest of the nation prepared to move the whole camp to the fort. So certain were they of success that they made about 1,000 packsaddles on which to carry the great booty that was to become theirs. The discovering party had left about 10 days when the main body was put in motion, which moved slowly with their tents and families through a district well stocked with buffalo, stopping a day or two occasionally to dry meat to enable them to sustain the siege. The whole amount of men able to bear arms in these 360 lodges was about 1,100 or 1,200 but as has been observed they had but few arms and were otherwise badly furnished for war.

The detachment under the Little White Bear traveled nearly the whole country of the Blackfeet without meeting any signs of their enemies who at that season were on a visit to some of the Hudson's Bay Co.'s posts on the tributaries of the Saskatchewan, but who usually returned in the latter part of the summer to the Missouri.

The party also approached near the fort in the night and made observations during the day, noting the number of persons in the establishment who pursued their usual outdoor occupations. From the neighboring woods and hills they could see unperceived, what number of horses the Whites had, how they were guarded, and examine that part of the ground most favorable to place their camp outside the reach of the fort cannon. After having satisfied themselves in every particular without being discovered they started homeward to give a most favorable report to their leader. Everything seemed to encourage the expedition so far. Buffalo were numerous near the fort, therefore meat could be had to sustain the siege, and the absence of all enemies relieved their minds as to any difficulty in marching the camp thither.

The return party went on their way in high spirits. So anxious were they to reach their people and urge the expedition forward that they neglected the usual caution observed by savages when traveling through a strange and hostile country. In place of inspecting the district, as they had done in their advance, they scattered over the hills shooting at everything in the way of game and raising the buffalo in every direction. This course soon attracted the notice of a large party of Blackfeet then on their way to war against the Crows. The former had all the advantage. Knowing from the signs mentioned that strangers were near, they hid the main band and sent out scouts to reconnoiter, who in the course of the day brought intelligence of a small body of people whom they had seen. In the night the whole body of Blackfeet moved forward within sight of the campfires of their enemies. Here they halted and sent a few expert scouts to crawl near enough to hear them talk. In this they also succeeded, and returned stating their number together with the pleasant news that they were their old and inveterate enemies the Crows. The party of Blackfeet numbered about 160 and were headed by Spotted Elk, a tried and experienced warrior.

About the break of day, while most of the Crows were yet asleep and their arms scattered carelessly around, they made the attack and in a short time most of the Crows were killed or disabled. Some fought like men but several saved themselves by flight. The Little White Bear was killed together with all but four who made out to escape and reach their own camp. Great was the mourning for their loss, and terrible vows taken for revenge. The Little White Bear was a great favorite with his people. He was a pleasant, liberal Indian, and being closely related to Rotten Belly, was his great support. Besides, his popularity in no way interfered with that of the head chief but rather reflected credit upon it by his submission to his orders and aid on all expeditions. On this occasion, the leader harangued through the camp his firm determination either to leave his body in the Blackfoot Country or to take ample revenge. The capture of the fort now became an object of more interest than ever. With the stores and ammunition that would thus be furnished they would be better able to contend with the powerful enemy whose country they were then invading.

As soon as the first burst of mourning was over he again put the camp in motion and by rapid marches soon came near the trading establishment, though they used every possible precaution to conceal their approach. About the first of August 1835, they encamped in the pine mountain situated 20 miles east of the fort. Here they all assembled to deliberate for the last time and make arrangements for their proceedings before entering upon a course of action so different from their former operations.

It was at this place also they fell in with a white trapper named James Coats, whom they well knew. He had made his spring hunt in the Rocky Mountains and was now on his way to the Blackfeet fort to dispose of his beaver. This man had been several years living and trapping with the Crow Indians, spoke their language tolerably well, and had some friends among them. Fearing, however, that if left to proceed he would disclose their intentions to the gentleman in charge of the fort, they forced him to remain. It has been said that Coats was in league with them for the purpose of pillaging the establishment, and as his usual character was of that description of renegades it may have been so, 'tho as will appear his conduct does not merit this reproach.

The American Fur Co., after considerable difficulty, had succeeded in opening a trade with the Blackfoot Indians in the year 1829. This large and fierce nation, previous to that period, visited the upper part of the Missouri along Maria and Belly Rivers only in the winter season in quest of beaver skins and buffalo robes, which they carried to the Hudson's Bay Co.'s post on the Saskatchewan and traded for arms, etc., to continue their hunts. Owing to their constant encounters with the white trappers in the Rocky Mountains near the heads of the Missouri, they conceived a deadly hatred to all white men, which continues in a measure to this day. In these battles the trappers invariably came off victors when taken in a body, but were cut off in detail when separated into small parties for the purpose of hunting beaver. Upon the whole the amount of loss was on the side of the trappers, though on many occasions they had fought desperately and killed numbers of the Indians.

In the year above mentioned, however, a few venturous persons with an interpreter were sent by the company with the pipe of peace, and a request to obtain permission to build a fort for their trade, promising to sell everything necessary for Indians at a lower rate than the British traders, and save the Indians the trouble of taking their skins to a distant market. After a good deal of parley this was agreed to. The post was built and well furnished with everything the Indians needed.[30] Still, however, suspicion existed on both sides. The fort was built of logs enclosed with high and strong pickets forming a square with the houses ranging along the sides and bastions on two corners built so as to command the four sides of the picketing. These bastions were furnished with cannon of small caliber, which, with a a good number of muskets, were always kept loaded in readiness for any attack from savages. From 30 to 50 men were usually stationed here during the fall and winter; most of them, however, were sent down the Missouri with the boats containing the robes and skins early in the spring leaving some 10 to 15 persons to pass the few summer months in the fort. In the month of August or September the annual supplies were received by a keel boat sent from Fort Union, hauling the same with a cordelle manned with 30 or 40 boatmen. Thus the fort received its reinforcement of men and stores before the Blackfeet returned from the English posts in the north, whither they always went in the summer.[31]

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[30] James Berger (or Bergier), a Canadian, who had become acquainted with the Blackfoot people and their language through earlier employment by the Hudson's Bay Co., was the agent through whom the American Fur Co. was able to establish trade with these Indians. Kenneth McKenzie sent Berger at the head of a small party to the Blackfoot in the winter of 1830–31. In the spring he returned to Fort Union with a party of 70 or more Piegan. These Indians agreed to the construction of a trading post in their country. Fort Piegan was built at the mouth of the Marias that fall (Maximilian, 1906, vol. 23, pp. 90–91; Larpenteur, 1898, vol. 1, pp. 109–115; Bradley, vol. 3, pp. 202–203).

It was during this interim the Crows (who knew all these things) expected to take the fort by surprise or reduce the small garrison to surrender by siege. The gentleman in charge of the post at the time they arrived in its vicinity was Mr. Alexander Culbertson, an experienced and determined man, who has since risen to be Chief Agent of the company for the whole Upper Missouri.[32] He had been a trader years before among different Indian tribes, spoke several languages fluently, and was well versed in all things regarding the business and the character and customs of the Indians. This gentleman, 'tho unaware of the hostile intent of the Crows, or even of their approach, did not neglect the usual precautions to be observed in a country surrounded by fierce and warlike tribes. He kept up a guard in the bastions both day and night and has his people mostly employed within the fort, except the few who were detailed on horse guard. They kept the animals but a few paces from the fort gates.

From the hills on the opposite side of the Missouri the advance scouts of the Crows could see and note undiscovered all that was going forward. They were not long in perceiving that the fort was well guarded and a surprise impracticable. They therefore reverted to their alternative, to lay siege. With this view some 25 or 30 active men concealed themselves during the night under the bank of the river about 100 yards from the front gate and as soon as the horses of the fort were turned out to graze rushed between them and the guards and drove them off. The men fired but missed their aim. So this source of subsistence was taken away. Very shortly after, the whole camp made their appearance and pitched their lodges in three divisions commanding the three sides of the fort but at such a distance as to be out of reach of cannon. The front of the fort was left unguarded as the inhabitants, having neither boats nor horses, could not escape with any property, 'tho it gave them an opportunity of evacuating the place without danger by fording the river.

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[31] Fort McKenzie, built as successor to Fort Piegan in 1832, was located "on the north side of the Missouri, about six miles above the mouth of the Maria, and about forty miles below the Great Falls of the Missouri, on a beautiful prairie . . . about 225 feet from the river" (A. Culbertson *in* Audubon, 1897, vol. 2, pp. 188–195). Maximilian spent a month at this fort in the late summer of 1833, and described the fort and the trade there in detail (Maximilian, 1906, vol. 23).

[32] Biographical sketches of Alexander Culbertson and his Blood Indian wife, Medicine Snake Woman, appear in McDonnell, 1940, pp. 240–246.

As soon as this disposition of his people was made, Rotten Belly came to the fort with a few followers and requested permission to enter, stating if that was granted he would willingly bring back the stolen horses. He spoke very friendly, said they intended no harm to the place or people, that they were on their way to find the Blackfeet, etc. The drift of this was he wished to see what force the place contained and to learn from some woman in the fort who spoke the Crow language what quantity of provisions were on hand. To all these requests and fine promises Mr. Culbertson turned a deaf ear and bade him go about his business.

On the second or third day of the siege the trapper, Coats, came to the fort and told Mr. Culbertson for the first time the real purpose of the Crows, advising him by no means to admit any of them. This certainly showed well on the part of Coats, but he also was particular in his enquiries regarding the amount of provisions on hand. It is thought he was sent by the Indians to ascertain this point. If so, he failed either in getting admission or information. It happened most unfortunately that the siege commenced at a time when the fort was actually in want of everything to eat. Buffalo had been scarce the previous winter. Very little dried meat had been made by the Blackfeet and still less traded by the fort. All flour, bread, pork, etc., had been expended 2 months before, 'tho the garrison would have had no difficulty in supporting themselves were they not prevented from hunting, as buffalo were numerous within sight of the fort. As the case then stood, but a few bales of dried meat formed their only resource. However, to produce an impression on the Indians that they had an abundance, nearly half was thrown over the pickets to them at different times when they came around asking for meat.

It may appear singular that the besieged would allow their enemies to come close to the pickets and parley every day without firing upon them, but those who are acquainted with the nature of the fur trade and the habits of the Indians will not be surprised. The company intended to locate trading establishments with all the tribes and to use conciliatory measures everywhere with the object of securing the friendship of all the nations. It was not their policy to use force except on occasions of self-defense and extreme emergencies. Had Mr. Culbertson killed any of these Indians it would have proved a great obstacle to the establishing of a trading post in their country, and likewise would have cut off all hope of escape in the event of being obliged to evacuate.

Matters being brought to this issue, the Indians generally remained quiet in their camp or hunting buffalo in the vicinity, at the same time keeping up a strict watch both night and day upon the fort, having come to the conclusion that ere long it would surrender for want of provisions. The garrison on the other hand, apprehending a long siege, reduced their rations to less than one-quarter of their customary allowance. Occasionally the Crows would come alongside and a parley would take place, though nothing important was thus elicited. At the end of 2 weeks the same state of thing existed, with the exception that the people in the fort had exhausted everything in the way of provisions. Even the few favorite dogs remaining were served up and dished out with a sparing hand to all. They had next to resort to the rawhides which had been used as coverings to the dried meat. These, although covered with dirt, grease, and paint, were cut up and boiled to something like the consistency of glue, and this mixture of all that was disgusting was used to sustain life for a few days longer. The hides being consumed, there remained only the cords made of skin which also were cooked and eaten, and absolute famine presented itself. Things now assumed a serious aspect. Most of the engagees were Canadians who, however hardy when well fed, are always the first to complain or revolt in trying times, notwithstanding their bragging. These urged Mr. Culbertson to abandon the place before they all starved to death. Loud were their murmurs and deep their curses upon his head for what they termed his desire to see them all die. But this gentleman, having determined on his course of action, was not a man to be deterred in carrying it out, neither by the murmurs of his own people nor the persevering siege of the Indians. He knew if they could preserve their lives for a short time, the whole Blackfeet Nation would soon arrive. The season for their appearance had already passed, as also that of the arrival of their annual keel boat up. Assistance might be expected from either or both these quarters. It appeared to him wrong and cowardly to surrender at the commencement of difficulty.

However, day after day passed by bringing forth nothing but increasing hunger—old skins, shoes, and all offals were greedily devoured. Still nothing turned up to encourage them. Men began to look at each other fiercely and that pitch of distress had been reached beyond which all would become too debilitated to act in any way. At this juncture Mr. Culbertson called up all hands and gave orders to prepare to give battle to the Crows as it was his intention to sally out in the morning with all his force and cannon, proceed near them and fight as long as any remained of his now feeble command. He was led to think, and experience had taught him, that a few well-directed discharges of artillery would drive them away. It is true that by evacuating the place they would all have been gladly allowed to pass unharmed, as their lives were not what the savages sought, but their property. But Mr. Culbertson knew that by leaving the establishment his act would be misinterpreted and lead to the stigmatizing of his character. All who are acquainted with the persons in the employ of the fur companies are aware that no allowances are made for circumstances, and that there is a prevailing disposition to traduce the name of anyone, more especially if he stands in a high position. He therefore decided either to force his enemies to leave the place or to die at the head of his people. It is somewhat remarkable that this plan met with but little opposition. Hunger had made his men desperate. Even those who some time before feared death in the distance now stood boldly forward to face the reality.

The siege had now occupied nearly a month. The camp was well supplied with meat and everything betokened a determination on the part of the Indians to hold out much longer. All hands then were armed and supplied with ammunition, having been informed that the sally would be made about midday following. This was about the time most of the young and efficient warriors were either out guarding their horses at a distance or hunting in different directions. It was a sorrowful night in the fort. All felt that their chance of success was doubtful, their death little short of certainty, but their wretched famished condition threw over the whole a gloom of sullen, silent resolve.

The eventful morning arrived; steadily and quietly this determined man proceeded to carry out his views, but it wanted yet a few hours to the time. When nearly ready the sentinels from the bastions observed some unusual commotion in the camp. Horses were being caught, warriors running about half armed, others riding off in various directions. Old men harangued, the council was called, and everything denoted some new and important event. The cause of all this was explained when on looking to the northwest small blue wreaths of smoke rose up in several places which were hailed with a shout of joy by all the fort. "The Blackfoot camp, our friends, our friends," was the cry of all. Arms were put away and once more smiles were seen on the lank and haggard countenances of these poor people. The Crows sent on discovery soon returned, the whole camp began taking down their lodges, packing their horses in great haste, and before the afternoon the whole camp had moved across the river and were out of sight. That same evening some Blackfeet runners arrived and the next day 800 lodges of these people encamped at the fort bringing plenty of meat.[33]

It is not our intention to give lengthy descriptions of circumstances of this kind or much more might be added that would interest the general reader. Strange things occur in this wild country. Singular emergencies arise which could be wrought up into romantic narrative. But we must not lose sight of the great Chief Rotten Belly, a sketch of whose life is here attempted.

The Blackfeet, as soon as they had been made aware of the conduct and number of the Crows, called a council but could not agree as to the expediency of pursuit. It was argued that although the Crows were inferior in numbers yet they were in a desperate state, greatly disappointed, and a bloody battle would be the result without much advantage to be gained. Indians usually reason in this way. They seldom risk much to gain little. They do not fight grand battles merely from a thirst for blood. Great disparity of force must exist before slaughter commences. Equality of numbers mostly prevents attack, in fact always does when not counterbalanced by the prospects of plunder or national revenge. These considerations had weight enough with chiefs and warriors of the Blackfeet to defer their operations against their enemies until a more favorable opportunity presented, when they could take them by surprise or cut them off in detail according to the usual custom of savage warfare.

The Crows, on the other hand, were glad to escape from their well-armed and numerous enemies. But having got beyond immediate danger they were halted by their chief. Rotten Belly was far from being satisfied. He had so far failed in every point he undertook to perform. His vows remained unfulfilled with the exception that should he fail he would leave his body in the country of the Blackfeet. This was yet in his power and was what he secretly resolved upon; for he knew this defeat and disgrace would lead to his downfall among his people.

While deliberating how to act so as in some way to regain his position and recover in a manner the ground he had lost, chance threw in his way what perhaps he would have most desired. It happened that a war party of 20 Blackfeet had been in the country of the Crows, and not finding them was on its return to its own nation. These proceeding in a careless way were discovered by the Crows while traveling. The chief and a few warriors in advance of the camp charged upon them, killed two, and the rest took refuge in one of the small wooden forts made by war parties, everywhere to be met with in the Blackfeet district. It was urged by most of the Crows that they should leave them alone, as they had already killed two without any harm to themselves, and by attacking the fortress they would undoubtedly lose some people. All agreed to this except Rotten Belly, who would have charged alone into the fort, but was detained by his people who held the bridle of his horse. It had not escaped the notice of the Crows that, since turning their backs on the trader's fort, this chief was dressed in his most gay and costly war suit. He wore his shirt and leggings fringed with human hair, his war eagle feather bonnet, and his robe of state covered with the scalp locks of his enemies hung over his shoulders. All this display on the occasion of defeat betokened some deadly determination which his friends, both by entreaty and gentle force, attempted to prevent. After disputing with them for a short time he promised to go away along with the rest and leave their enemies for some other time when they could destroy them with less risk to themselves. His horse being set free of the grasp of his followers, he made him prance around as though in sport, then shouting aloud, "One last stroke for the Crow Nation; two Blackfeet cannot pay for the loss of The Little White Bear," he rushed at full speed upon his foes. Making his charger leap the small stockade into the midst of his enemies, he pinned one to the ground with his lance, but received a dozen arrows in his body and fell to rise no more. His people followed close behind, fell upon the Blackfeet, and cut them off to a man without further loss than that of their leader. But this was to them the greatest that could happen. In conformity with his request on several occasions, his body was wrapped in its warrior shroud and deposited on a tree in the country of the Blackfeet to be, as he said, a terror to them even after death.

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[33] This siege actually occurred in June 1834. J. Archdale Hamilton, in a letter to Kenneth McKenzie, written from Fort Union September 17, 1834, stated that the Crow compelled the defenders "to live on Cords Parfleche for 15 days" (letter in Missouri Hist. Soc., St. Louis). Yet the detailed account of the siege in "Extracts from Mr. Culbertson's Journal Kept at Fort McKenzie, Blackfeet Indian Country in 1834," copied by Audubon at Fort Union in 1843, states that it lasted only 2 days, June 25–26, and that a party of Blood Indians brought meat to the defenders on June 30 (Audubon, 1897, vol. 2, pp. 178–180). Bradley's two accounts of this siege, presumably based upon information furnished him by Culbertson four decades after the action, also differ in detail from the Denig version on some points (Bradley, vol. 2, pp. 181–182; vol. 3, pp. 210–215). Probably the bare facts of this dramatic siege had become somewhat embroidered through two decades of verbal retelling before Denig wrote his version of the action in 1856.

The lives of most Indian chiefs bear a strong resemblance. The history of one is that of all—the same battles, victories, defeats, and deaths proceed from their unvarying wars with their enemies, and are likely to continue as long as any tribes remain. Among all these nations, where daily struggles take place for each others' lives and property, instances of individual daring arise which, among civilized men in what is called honorable warfare, would immortalize their names but which, for want of record, must soon be forgotten. The fame of any Indian chief is but short-lived. A few days of mourning is all that can be devoted to his memory. Their existence demands action, their force a leader. Their disposition is ambitious, and long before the death of their favorite chief takes place, some other candidate for his office is spoken of and approved. This often happens before the decease of a leader. Any great defeat or mismanagement on his part would transfer the power to another who had given proof of his bravery and abilities.

The loss of Rotten Belly was deeply felt and regretted by the Crows, perhaps more than that of any other man either before or since his time. Even to this day he is spoken of as *the* Chief, or the *Great Chief.*[34] Other men now took charge of different portions of the Crows who separated into several bands and resumed their old habits and hunting grounds.

OF TRADE AND WAR

The year after the above event, a fort was built at the mouth of Rose Bud River on the Yellowstone for the trade with this nation. It furnished them with arms and other necessaries, and they slowly recovered from the disastrous effects of the smallpox.

Before a trading post had been permanently placed in their country the Crows carried their furs to the Arikara and Mandan forts on the Missouri and disposed of them there. At that time they hunted nothing but beaver, the skins of which were then valuable and easy of transportation. They had not as yet turned their attention to preparing buffalo robes for sale, making only a sufficiency for the use of themselves and families. When the company paid them good prices for their robes it gave them an opportunity to equip themselves better for hunting and war then heretofore and tended considerably to restrict their wandering habits. The camps remained stationary during the fall and winter months near the fort, where they employed their time in killing buffalo, dressing their hides, and purchasing such articles as they most wanted either for defense, convenience, or barter for horses with the tribes farther in the mountains.

Still war was kept up, mostly in the spring and summer, with the different nations mentioned who were considered enemies. In these conflicts the Crows generally lost. At least, they being the smaller tribe, the fall of every warrior or hunter was more severely felt. All winter parties of Blackfeet, Sioux, Assiniboines, and other hostile nations hovered round their encampments, killed stragglers, and drove off numbers of their horses. On the return of the summer months the Crows went in large numbers to revenge these coups and often bloody battles ensued with considerable loss on both sides.

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[34] Denig's biography of this important Crow chief is the most detailed story of his life that is known. It is corroborated in part and expanded in the works of other writers. Curtis was told that Rotten Belly was second chief of the tribe at the time of the first Crow treaty with the United States, at the Mandan Villages, August 4, 1825, although he refused to sign that treaty. Maximilian witnessed the presentation of a medal to Rotten Belly by John A. Sanford, Indian Subagent, at the Mandan Villages in June 1833. He described Rotten Belly as "a fine tall man, with a pleasing countenance" who "had much influence over his people." This chief was well known to such prominent fur traders as Robert Campbell, N. C. Wyeth, and Captain Bonneville. News of Rotten Belly's death in battle with the Blackfeet was entered in Fort Pierre Journal, August 8, 1834. In 1876, the Crow Indian, Little Face, furnished Bradley a number of stories illustrating Rotten Belly's war record and the potent supernatural powers attributed to him by his tribesmen (Bradley, vol. 9, pp. 299–307; Curtis, 1909, pp. 47–48; Chardon, 1932, pp. 4, 253; Irving, 1851, pp. 189–191, 194–196, 352, 415–416; Maximilian, 1906, vol. 22, p. 351).

FACTORS LIMITING THE INCREASE OF CROW POPULATION

No great national calamity overtook them until the year 1848, when the smallpox again made its appearance, they having received the infection from the Snake Indians with whom they were at peace; the Snakes having contracted the pestilence in their dealings with emigrants passing along the Platte Trail. It does not appear to have been nearly so destructive as the same disease at the former period mentioned, 'tho numbers of children died.[35] In 1849 the greater part of the Crow Nation was visited by an influenza of so destructive a nature as to take off about 600 persons, among whom were some of the best warriors and wise councilors.[36] Since the last date no great havoc has been wrought by epidemics, 'tho they cannot be said to be much on the increase.

Several things tend to prevent their augmentation. Setting aside the loss by war and deaths by different maladies incident to human life, the propagation of the venereal disease among them appears to be the greatest bar to their prosperity, both by its fatal nature and the inability of the tainted persons to procure wives or husbands. Infanticide is also publicly practiced by two-thirds of the married women. Unwilling to be troubled by raising their children, they either kill them in utero, or as soon as brought forth, 'tho the former manner is the most common. Abortions are produced by administering blows on the abdomen or by pressing upon it with a stick, leaning their whole weight thereon and swinging to and fro. The foetus is thus ejected at different periods of its growth, varying from 3 to 7 months. As they are not aware of the danger attending the practice many women die in attempting it. It has been computed by those well acquainted with this tribe that three-fourths of all the women who die are lost in this manner. Usually the husband consents to it, or at least does not punish his wife for so doing, but of late years the voices of all or most of the men are against the crime and it is becoming more rare. The act now reflects disgrace on both the father and mother of the child and, if not done so frequently, it is at least concealed from the public.[37]

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[35] Indian Agent Vaughan claimed that the Crow on the headwaters of Powder River caught the smallpox from the Shoshone, who had contracted it from California emigrants, in the fall and winter of 1851. This epidemic, he said, reduced Crow numbers by 30 lodges, killing some 400 members of the tribe in a short time (Ann. Rep. Comm. Ind. Aff., 1853, p. 354).

[36] Kurz (1937, pp. 215–216), on October 28, 1851, wrote that influenza had been "dangerously prevalent" among the Crow the previous winter, killing some 150 members of the tribe "among them some of their most prominent tribesmen." Some of the Crow believed Denig had inflicted the disease upon them in retaliation for their theft of 10 horses from Fort Union. "To prevent further spread of the disease . . . the Indians brought back nine of the stolen horses."

This disgusting and unnatural custom is not peculiar to the Crows. It exists to a more or less extent among all nations of the Upper Missouri but not in such a degree as to effect much their natural increase.

CROW HERMAPHRODITES

Another thing worthy of note with these Crows is the number of Berdêches or hermaphrodites among them. Most civilized communities recognize but two genders, the masculine and feminine. But strange to say, these people have a neuter. This does not proceed from any natural deformity, but from the habits of the child. Occasionally a male child, when arrived at the age of 10 or 12 years or less, cannot be brought to join in any of the work or play of the boys, but on the contrary associates entirely with the girls. Now all the amusements of boys and girls are marked and distinct. The former, at a very early age, are instructed in the use of the bow, shooting at birds, guarding horses, trapping rabbits and other small game, while the latter are taught to cook, dress skins, make moccasins, work with beads and porcupine quills all articles of clothing, and other servile and feminine acquirements. Children of different sexes seldom associate either in their work or play, 'tho as has been observed, instances do occur in which a boy acquires all the habits of a girl, notwithstanding every effort on the part of his parents to prevent it. The disposition appears to be natural and cannot be controlled. When arrived at the age of 12 or 14, and his habits are formed, the parents clothe him in a girl's dress and his whole life is devoted to the labors assigned to the females. He is not to be distinguished in any way from the women, 'tho is seldom much respected by either sex. The parents regret it very much but to no purpose. There used to be some five or six of these hermaphrodites among the Crows, 'tho at the present time there are but two or three. One of these has been married and presents the anomaly of husband and wife in the same dress attending to the same domestic duties.[38]

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[37] Denig (1930, p. 521) stated, "It is not far from the correct number if we state that one-eighth of the children are destroyed in utero or after birth by the Crow women."

[38] Sexual abnormalities among the Crow were mentioned by both earlier and later writers. In 1806 Alexander Henry wrote, "I am informed they are much addicted to unnatural lusts, and have no scruple in satisfying their desires with their mares and wild animals fresh killed" (Henry and Thompson, 1897, vol. 1, p. 399). Maximilian (in 1833) stated, "They have many bardaches, or hermaphrodites, among them, and exceed all other tribes in unnatural practices" (Maximilian, 1906, vol. 22, p. 354). Father De Smet described a Crow warrior who "in consequence of a dream had put on women's clothing and subjected himself to all the labors and duties of that condition, so humiliating to an Indian" (Chittenden and Richardson, 1905, vol. 3, p. 1017). While on the Crow Reservation in 1902, Simms was informed that there were three hermaphrodites in the tribe and that "a few years ago an Indian agent endeavoured to compel these people, under threat of punishment, to wear men's clothing, but his efforts were unsuccessful" (Simms, 1903, pp. 580–581). Lowie reported but one surviving berdache on that reservation in 1912 (Lowie, 1912, p. 226).

THE CROW TOBACCO-PLANTING CEREMONY

Before closing our remarks on these people, some account of their superstitions appears to be demanded. The power ascribed to their priests and medicine men differ in many respects from those of other tribes. Wherever this is the case, separate descriptions and explanations have been promised in former parts of this work. Hereafter the religion of all the tribes will be minutely considered, its elements disclosed and its effects commented on; but in this place it will only meet with notice so far as to inform of some rites and ceremonies which have a great influence on their national character and government.

The term "medicine men," as now used, has no reference to those who use drugs to cure diseases, but to such as are thought by the entire population to possess superhuman powers to bring about events. Sometimes these persons are supposed to be gifted with the spirit of prophecy, or to work evil ends. This is a prevalent idea with the majority of the roving tribes and will meet with further explanation. But the Crows center *all* power in the *Tobacco Planters.* These are their own people and exhibit no outward difference either in dress or manners from their neighbors, 'tho they are believed to have control over events, seasons, the elements, animals, and all things usually attributed to the works of an overruling Providence. In fact they have no idea of a Supreme Being, a first cause, or of a future state. Neither do the great lumenaries the sun and moon appear to them objects of much veneration, 'tho they are somewhat afraid of thunder.

This nation has from time immemorial planted tobacco. They have carefully preserved the original seed discovered with the continent, which produces leaves similar to the cultivated plant in the Western States and has something of its taste and flavor. They believe that as long as they continue to preserve the seed and have in their homes some of the blossom they will preserve their national existence. They say as soon as none is found they must pass away from the face of the earth. Several other traditions also tend to the continuation of the custom of tobacco planting. Among the first is that those who fulfill the orders of their ancestors in this respect shall be endowed with supernatural powers, to bring rain, avert pestilence, control the wind, conquer disease, make the buffalo come near their camp, and increase the number of all kinds of game; that they can in fact bring about any event not dependent upon ordinary human possibility. This is confined to the few who plant the tobacco, and who, knowing the power and standing thus to be gained, are very anxious to keep up the superstition with the ceremonies attending it. Sometimes, with a view to acquiring property, one of them will sell his right or powers to some aspiring individual. In this case the candidate gives everything he has in the world—all his horses, dresses, arms, even his lodge and household utensils—to pay for the great medicine and honor to become a Tobacco Planter. On an occasion of this kind the applicant is adopted with great ceremonies into the band of Planters. His flesh is cut and burned in large and deep furrows around the breast and along his arms, leaving for a long time dangerous and disgusting wounds difficult to heal. He is also obliged to go several days without food or water. After passing through this ordeal, he is furnished with some tobacco seed, in exchange for everything that he possesses. In this way the rite is perpetuated, and never has received the least check or interruption. On the contrary, it appears to become more honorable from being more ancient and from the difficulties attendant on becoming a conductor of the ceremony.

The customary place for the planting of the tobacco is on Wind River at the base of the mountain having that name, 'tho it is not confined to this spot alone. Other places are sometimes sought more convenient for the camp when the season arrives. At an appointed spot then the whole nation are invited to meet in a certain moon, which corresponds with about the middle to the last of April. When encamped in the vicinity the women of the camp are detailed to clear off all bushes and rubbish from a space of ground about half an acre square. Even the cleaning of this place is accompanied with the beating of drums, singing, and smoking at intervals. This usually occupies the first day. On the next the spot is hoed, either with iron instruments or with the shoulder blades of buffalo. The latter is the primitive utensil. This operation consumes the greater part of the second day. The third is ushered in by loud haranguing, feasting, singing by the Planters, and all married men and women, mounted on horseback, proceed in file to the neighboring trees and cut each a faggot of wood which is tied together and carried before them on the horse. The women take precedence, and it is distinctly understood that the female who brings in the first bundle of wood must be one who has had no illicit connection with any man but her husband. If she attempts to deceive, the person who is aware of, and a participator in, her guilt steps forward and cries aloud, "she is lame," or unfit for the post of honor; in which case she is forever disgraced. This has happened more than once. Indeed so rare is a virtuous woman in this nation that the above requisition has several times been nearly the cause of an entire suspension of the custom; for they would rather relinquish the whole than alter the manner in which the ceremony has been transmitted to them by their forefathers. Heretofore, however, they have succeeded in finding *one* virtuous female, or one said to be so, 'tho, as has been observed, the search has been attended with difficulty. The next important step taken in this great national solemnity is to select a man who will solemnly swear he has never slept with any of his relatives' wives more nearly akin than a brother-in-law, that tie included. This individual is found previously to their going after the wood and he brings in the second faggot. Singular as it may appear, the moral character of the males is not superior to the female part of the community, and several weeks have often been employed in the seeking and approving of a man free from the crime of incest. At one time so great was their anxiety to proceed with their custom, and so rare was the proper person that they were obliged to employ one of the gentlemen of the Fur Company to fill the office. Therefore, it may safely be conjectured that if no improvement takes place in their moral condition the rite of tobacco planting will soon be at an end. To proceed. When the two loads of wood are thus cast upon the cleared spot, all the rest follow after, one at a time laying down his burden with great solemnity, encouraged by the Planters, who are stationed round singing and drumming. Beside each of the medicine men are placed pans and bowls of cooked meat, tongues, pemmican, dried berries, and other eatables considered by them as delicacies. Those who lay down a bundle of wood go and seat themselves around these dishes and eat as much as they can. Great quantities are consumed, which have been laid up for months beforehand in anticipation of the above ceremony. When the wood is all collected, it is separated into four large piles, one of which is placed on each corner of the square patch intended for cultivation. Then these piles are all separately smoked to and invoked. Indeed, any and every movement they make during the whole performance partakes of a sacred character. The wood is then strewn equally over the surface of the place, fire put to it and burned to ashes. The whole is rehoed and threshed with willows, which serves the purpose of harrowing. Much time is employed in invocation and other ceremony over the tobacco seed, which in the end is mixed with fine earth and ashes and scattered over the garden. The place is then threshed with brush a second time for the purpose of burying the seed.

Having arrived at this point of the ceremony a grand medicine lodge next claims their attention. This is made by forming a large tent with 8 or 10 lodges connected by poles, sufficiently commodious to contain 200 or 300 persons. The interior is decked out with cloths of brilliant colors, beads, and various other ornaments. Large feasts are cooked and placed therein, and a full band of drums, rattles, bells, and whistles keeps up a deafening and continual noise. Dancing goes forward after the eatables have been dispatched. These dances are conducted with strict decorum, as they, with all the rest of the ceremony, are supposed to bring about a state of happy and prosperous national affairs. Several persons on these occasions cut and scar their arms and bodies, and exert themselves in dancing without food or water for such a length of time that they are carried away in an unconscious condition from which some are with difficulty revived.

This amusement, or rather devotion, usually occupies three more days, at the end of which time they move camp and march about half a mile, the next day about a mile, the third and fourth about as much more. The idea is that they do not wish the tobacco to think they are running away from it, but are so fond of it as scarcely to have the wish to depart.

As soon as possible after the seed is sown it is desirable to have rain that the same may be washed into the earth and take root. One of the Planters then undertakes to produce rain, and by his desire merchandise and other property is collected from the band often to the amount of 2 or 3 thousand dollars. These articles are freely given to the medicine man by the rest, considering them as sacrifices to the clouds. The Tobacco Planter, after hanging up the different articles on the bushes around, commences a series of smokings and prayers to the heavens for rain. If he succeeds, the whole of the sacrifices belong to him and he acquires increase of fame. But if no rain falls, the goods are suffered to lie there, 'tho no blame is cast on the Planter, for he cunningly asserts that the time is not propitious and that some of the nation have not fulfilled their promises, etc. Occasionally he takes advantage of clouds gathering to predict rain, which would most likely fall without his aid. But they are so blind and bigoted that they actually believe in his power to produce it. One of these Planters can do anything (so they think), can make the grass grow, make buffalo plenty, and foretell any great calamity arising from disease or attacks from enemies.

When all this parade is over the camp resumes its ordinary occupations and traveling, until, about the latter end of August, it marches again to the tobacco field, when they pull the plant up and pack it into sacks. The seed is separated from the blossom and preserved; the stock and leaves are carefully stored away, only to be used on great occasions such as peacemaking with other nations, and religious rites of a national character. It is also used in extreme cases of sickness, not as a drug, but in their usual superstitious manner of smoking, believing its efficacy to consist in the article itself, rendered sacred and powerful by ceremony, and the smoke emitted through the nostrils of a Tobacco Planter.[39]

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[39] Curtis obtained a tradition to the effect that No Vitals, who quarreled with the Hidatsa over the buffalo and led the Crow Indians westward to become their first chief, originated the tobacco ceremony. Lowie found the Crow regarded the tobacco as their distinctive medicine, equivalent to the medicine pipe of the Hidatsa. Denig's early description of the tobacco-planting ceremony contains many details lacking in accounts of this ceremony based upon field investigations a half century later, and after the Crow had settled down to sedentary reservation life. (Compare Curtis, 1909, pp. 61–67; Simms, 1904, and Lowie, 1919, entire.)

The foregoing is a rapid sketch of this principal national religious rite. There are many others of smaller note, resembling in every respect those of other tribes, which will be more minutely discussed in another place.

CHIEF LONG HAIR

Since the time of Rotten Belly no great man has ruled the nation. It is at present separated into smaller communities, each governed by a chief. The principal man after the chief above named was Long Hair, so called from having hair on his head 36 feet in length. Although it may appear singular that any human being should be in possession of this length of hair, yet it is nevertheless true. Encouraged by a dream, when a young man, that he would become great in proportion to the growth of his hair, he tied weight to it, which aided its growth, and every few months separated the locks into small parcels which were stuck together with the gum of the pine tree. In this way none of his hair could be lost. If any fell out the gum prevented it from dropping. At the age of 50 his hair was the length mentioned, 'tho no single stalk was longer than usual among females of our own color. This cumbersome bunch of hair he rolled up into two large balls and carried them in front of his saddle while riding. When on foot, the rolls were attached to his girdle. On great festivals he mounted on horseback, unrolled his hair, and rode slowly round the camp with his scalplocks trailing some distance behind him on the ground.

Whether or not it was this peculiarity that brought him into notice we cannot say. No doubt it aided considerably, 'tho he also is spoken of as a brave man. He rose to high power, was well liked, and died a few years since.[40] At this date, 1856, the Crows have peace with the Assiniboines and some bands of Sioux with whom they occasionally reside and exchange presents.

CHIEF BIG ROBBER

At the treaty of Laramie in 1851, The Big Robber was made chief of the nation by the United States Commissioners, but since that time he has not governed his people. In place of remaining with the greater portion, he is generally found near the emigrant trail along the Platte with a few lodges who do nothing but beg and steal, and contract diseases from passing emigrants which sweep off numbers of his people. He is now despised by the other bands. He has no command, is not respected, as much for seeking other districts as for not remaining and assisting in defending his own country.

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[40] "The Long Hair" was the first signer of the Crow's first treaty with the United States at the Mandan Villages, August 4, 1825. Bradley stated that Long Hair was head chief of the numerically superior Mountain Crow, Rotten Belly head chief of the River Crow, after the division of the tribe due to jealousy between these leaders. Little Face, Bradley's principal Crow informant, considered Long Hair the greater of the two leaders. Leonard met Long Hair in the fall of 1831, shortly after Rotten Belly's death. He termed Long Hair "the principal chief or Sachem of the nation and is quite a worthy and venerable old man of 75 or 80 years of age," who "worships nothing but his hair, which is regularly combed and carefully folded up every morning into a roll about three feet long by the principal warriors of his tribe." Leonard said that Long Hair's tresses were "no less than nine feet eleven inches long." Maximilian claimed they were "ten feet long," and Catlin said Messrs. Sublette and Campbell assured him "they had measured his hair by correct means, and found it to be ten feet and seven inches in length; closely inspecting every part of it at the same time, and satisfying themselves that it was the natural growth" (Bradley, vol. 9, pp. 312–313; Catlin, 1841, vol. 1, pp. 49–50; Leonard, 1904, pp. 255–257; Maximilian, 1906, vol. 22, p. 353).

PROSPECTS FOR INTERTRIBAL PEACE

A portion of the nation now passes the winter with the Assiniboines, with whom they make out to agree, 'tho the latter steal their horses to some extent. But the Crows are solicitous for peace with all tribes except the Blackfeet, with whom they wish to be at war as long as one of them remains.

The late treaty with the Blackfeet may have the effect of annexing the Piegans and Gros Ventres of the Prairie to their list of friends, but the Blood Indians and Blackfeet will never be brought to live at peace with any of the surrounding nations.[41]

BIOGRAPHY OF WOMAN CHIEF

Perhaps the only instance known of a woman attaining the rank of chief among any of the tribes whose histories we attempt has happened among the Crows. It has ever been the custom with these wandering people to regard females in an inferior light in every way. They have no voice in council, or anything to say at assemblies formed by men for camp regulations. Even the privilege of intimate conversation with their husbands is denied them when men are present. They have their own sphere of action in their domestic department, from which they are never allowed to depart, being considered by their husbands more as a part of their property than as companions.

This being the case, they seldom accompany parties to war. Those who do are of the lowest possible description of character, belong to the public generally, have no home or protection. Sometimes females of this stamp are taken along to make and mend shoes, dry meat, cook, etc., but they are never allowed to take part in battle. Even if they were, their inexperience in the use of weapons would soon cause their death. For such as these there is no opportunity to distinguish themselves. They must be content with the station of servant and that of the very lowest kind of drudgery.

The case we are about to relate is that of a Gros Ventre of the Prairie woman taken prisoner by the Crows when about 10 years of age.

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[41] Denig's hope for peace between the Crow and Piegan following the first Blackfoot treaty with the United States, at the mouth of the Judith River, October 17, 1855, was not realized. For four decades after that treaty was signed the Piegan continued to make raids upon the Crow camps.

From a personal acquaintance of 12 years with this woman we can lay her true history before the reader.

Shortly after her capture the warrior to whom she belonged perceived a disposition in her to assume masculine habits and employments. As in the case of the Berdêche who, being male inclines to female pursuits, so this child, reversing the position, desired to acquire manly accomplishments. Partly to humor her, and partly for his own convenience, her foster father encouraged the inclination. She was in time placed to guard horses, furnished with bow and arrows, employing her idle time in shooting at the birds around and learning to ride fearlessly. When further advanced in years she carried a gun, learned to shoot, and when yet a young woman was equal if not superior to any of the men in hunting both on horseback and on foot.

During her whole life no change took place in her dress, being clad like the rest of the females with the exception of hunting arms and accoutrements. It also happened that she was taller and stronger than most women—her pursuits no doubt tending to develop strength of nerve and muscle. Long before she had ventured on the warpath she could rival any of the young men in all their amusements and occupations, was a capital shot with the rifle, and would spend most of her time in killing deer and bighorn, which she butchered and carried home on her back when hunting on foot. At other times she joined in the surround on horse, could kill four or five buffalo at a race, cut up the animals without assistance, and bring the meat and hides home.

Although tolerably good looking she did not, it seems, strike the fancy of the young men, and her protector having been killed in battle, she assumed the charge of his lodge and family, performing the double duty of father and mother to his children.

In the course of time it happened that the Blackfeet made a charge on a few lodges of Crows encamped near the trading fort in their country—our heroine being with the lodges. The attack was sudden. Several men were killed and the rest took refuge within the fort saving most of their horses. The enemies made a stand beyond the reach of guns and by signs exhibited a desire to speak to someone in the fort. Neither Whites nor Crows could be found to venture out. But this woman, understanding their language, saddled her horse and set forth to meet them. Everyone sought to detain her, but she would not be persuaded. The fort gates were opened and she went on her dangerous errand. When arrived within hailing distance, and about half rifle shot, several Blackfeet came to meet her, rejoicing in the occasion of securing an easy prize. When within pistol shot, she called on them to stop, but they paid no attention to her words. One of the enemies then fired at her and the rest charged. She immediately shot down one with her gun, and shot arrows into two more without receiving a wound. The remaining two then rode back to the main body, who came at full speed to murder the woman. They fired showers of balls and pursued her as near to the fort as they could with safety approach. But she escaped unharmed and entered the gates amid the shouts and praises of the Whites and her own people.

This daring act stamped her character as a brave. It was sung by the rest of the camp, and in time was made known to the whole nation. About a year after, she collected a number of young men and headed her first war excursion against the Blackfeet. Fortune again favored her. She approached their camp in the night, stole 70 horses and drove them with great speed toward her home. But the enemies followed, overtook them, and a sharp skirmish ensued, which resulted in the Crows getting off with most of the animals and two Blackfeet scalps. One of the two Blackfeet the woman chieftain killed and scalped with her own hand. The other, although shot down by one of her followers, she was the first to strike and taken from him his gun while he was yet alive 'tho severely wounded. It may reasonably be supposed that coups such as these aided to raise her fame as a warrior, and according to their own usages, from the fact of striking first the bodies of two enemies, she could no more be prevented from having a voice in their deliberations. Other expeditions of a still more hazardous nature were undertaken and successfully carried through by this singular and resolute woman. In every battle around their own camp or those of their enemies some gallant act distinguished her. Old men began to believe she bore a charmed life which, with her daring feats, elevated her to a point of honor and respect not often reached by male warriors, certainly never before conferred upon a female of the Crow Nation. The Indians seemed to be proud of her, sung forth her praise in songs composed by them after each of her brave deeds. When council was held and all the chiefs and warriors assembled, she took her place among the former, ranking third person in the band of 160 lodges. On stated occasions, when the ceremony of striking a post and publicly repeating daring acts was performed, she took precedence of many a brave man whose career had not been so fortunate.

In the meantime she continued her masculine course of life, hunting and war. Heretofore her attention had been but little attracted to personal gain in the way of barter. Whatever hides she brought home from the hunt were given to her friends, 'tho the meat was cured and dried by herself and the children under her charge. When horses were wanting she drew upon her enemies for a supply and had been heretofore uniformly successful. She had numbers of animals in her possession, with which she could at any time command other necessaries.

But with Indians it is the same as with civilized persons. The richer they become the more desirous they are of acquiring more. As yet no offer of marriage had been made her by anyone. Her habits did not suit their taste. Perhaps they thought she would be rather difficult to manage as a wife. Whatever the reason was, they certainly rather feared than loved her as a conjugal companion, and she continued to lead a single life. With the view of turning her hides to some account by dressing them and fitting them for trading purposes, she took to *herself a wife*. Ranking as a warrior and hunter, she could not be brought to think of female work. It was derogatory to her standing, unsuited to her taste. She therefore went through the usual formula of Indian marriage to obtain an authority over the woman thus bought. Strange country this, where males assume the dress and perform the duties of females, while women turn men and mate with their own sex!

Finding that employing hands advanced her affairs in the lodge, in a few years her establishment was further increased by taking three more wives. This plurality of women added also to her standing and dignity as a chief; for after success at war, riches either in horses or women mark the distinction of rank with all the Prairie tribes. Nothing more was now in her power to gain. She had fame, standing, honor, riches, and as much influence over the band as anyone except two or three leading chiefs. To either of their offices she could in no wise expect to succeed; for to be a leader requires having strong family connection, extensive kindredship, and a popularity of a different description from that allotted to partizans. This being the case, she wisely concluded to maintain her present great name instead of interfering with the claims of others to public notice. For 20 years she conducted herself well in all things appertaining to war and a hunter's life.

In the summer of 1854 she determined to visit in a friendly way the Gros Ventres of the Prairie to which nation, it has been observed, she owed her parentage. The treaty with the Upper Missouri tribes held at Laramie in 1851 had been followed up by overtures of peace to the Blackfeet and the Gros Ventres of the Prairie. The entire body of the latter, with a portion of the former, evinced a willingness to abstain from war excursions, and sent friendly messages to the Crows and Assiniboines containing invitations to visit them. The Assiniboines did so, were well received, hospitably entertained by the Gros Ventres, and dismissed with horses as presents. This intercourse was kept up for 3 or 4 years, with entire satisfaction to both parties, although the Crows had not as yet presented themselves at the camps of their former enemies. With the view of ascertaining how far their hostile spirit had been quelled, and perhaps of gaining a goodly number of horses, this Woman Chief undertook a visit there, presuming that, as she was in fact one of their nation, could speak their language, and a general peace was desired, she could associate with them without being harmed. Many old and experienced fur traders endeavored to dissuade her from this journey, as her feats against them were too notorious to be easily overlooked. But contrary to the advice of her friends she proceeded.

When near the camp, however, she encountered a large party of the Gros Ventres of the Prairie who had been to Fort Union and were returning home. These she boldly met, spoke to, and smoked with. But on their discovering who she was, they took the advantage while traveling with her to their camp to shoot her down together with the four Crows who had so far borne her company.

This closed the earthly career of this singular woman and effectually placed a bar to any hopes of peace between the Crows and her murderers. Neither has there since appeared another of her sex who preferred the warrior's life to that of domestic duties.[42]

DANGERS ENCOUNTERED IN THE FUR TRADE WITH THE CROWS

Before closing our remarks on this people, something regarding the trade with them might not be amiss, for the fort built in their country has been the theater of more war and bloodshed both of Whites and Indians than any other spot occupied by the fur traders. From the year before named until 1855, forts have been built in different places along the Yellowstone at distances varying from 150 to 300 miles from its conflux. The mouths of the Tongue River, Rose Bud River, Powder River, Big Horn, O'Fallon's Creek, and the Little Horn have all at times been occupied by trading posts, to which annual supplies were sent up in a mackinaw boat towed with a cordelle by 15 to 20 men, some of whom remained to bring down the peltries the ensuing spring, the others returned to the starting point, Fort Union, at the mouth of the Yellowstone.[43] This river is very difficult to navigate at any season. During the summer flood the banks fall in. The current is very swift and the whole surface of the river is covered with floating trees and driftwood. After this stage the river falls too low and the danger then is confined to the sandbars, snags, and ledges of rock reaching nearly across the stream. Through these rocks the water runs with such velocity as not to admit of a loaded boat being hauled through. It is unloaded and the merchandise transported on men's shoulders by land to where the river is less turbulent. These rapids occupy nearly 100 miles in length. For the greater part of this distance the goods are carried by the men and the empty boats dragged up the stream. The downward navigation is more dangerous still. On these rapids the boats are often broken and both men and cargoes lost. The banks of the Yellowstone, moreover, are infested by hordes of Blackfeet Indians or Sioux, both hostile to either Whites or natives. The well-timbered bottoms of the river and deep-cut coulees in the hills afford excellent lurking places for marauding parties ready to kill or rob whenever opportunity offers.

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[42] Kurz met "the famous Absaroka amazon" at Fort Union, October 27, 1851. He said she "looked neither savage nor warlike. . . . She is about 45 years old; appears modest in manner and good natured rather than quick to quarrel." She gave Denig a Blackfoot scalp, which she had taken herself, which Denig presented to Kurz for his collection (Kurz, 1937, pp. 213–214). In his report to Governor Stevens, Denig included a briefer account of this woman's career (Denig, 1930, pp. 433–434). In that source he mentioned an Assiniboin woman had attempted to imitate the Crow woman warrior, only to be killed on her first war excursion. J. Willard Schultz has written a fictionalized biography of Running Eagle, the noted Piegan woman warrior (Schultz, 1919). Running Eagle, who was killed by the Flathead following a series of successful war exploits, was remembered by elderly men on the Blackfeet Reservation, Mont., in the early 1940's. Presumably her war career was initiated after Denig's description of the Crow woman was written. However, she may have been inspired by the example of the Crow's Woman Chief.

But all these difficulties are of a trifling nature when compared to the situation of the traders around their own fort. Scarcely a week passes but attacks are made on those whose work obliges them to go beyond the gates of the stockade. The Sioux on the one hand, and the Blackfeet on the other, constantly in search of the Crow Indians who are supposed to be near the fort, make this place the center of their operations. When the Crows are stationed in the vicinity all attacks fall upon them, and well they retaliate. But when there are no Indians those who cut wood, guard horses, or go in quest of meat by hunting feel the murderous strokes of these ruthless warriors. Each and every year from 5 to 15 persons attached to the trading establishment have been killed, since commerce has been carried on with the Crows in their own district. The Blackfeet view the fort for the Crows in the light Rotten Belly did that for them. It supplies their enemies with arms and munitions of war, besides other conveniences for hunting and existing as a nation. Also the Blackfeet never entirely forgot the attempt of the Crow chieftain to cut off their support by besieging their fort in the hopes of being able to pillage it. They have always been a fierce people, killing the trappers in the mountains, in which encounters they suffered loss which they revenge to this day on any and all white persons not connected with the trading establishment in their own region. Sometimes these, too, go before their savage dispositions.

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[43] For the Crow trade the American Fur Co. and its successors built four trading posts on the Middle Yellowstone in less than a quarter century. Each in turn was abandoned after a few years' service. There were Fort Cass (1832–38), Fort Van Buren (1839–42), Fort Alexander (1842–50), and Fort Sarpy (1850–55) (Chittenden, 1902, vol. 2, pp. 964–965; Larpenteur, 1898; vol. 1, pp. 115, 170–175; McDonnell, 1940, pp. 282–283).

The Crows never passed the summer in the vicinity of the fort. At that season they were with the Flatheads, Snakes, or Nez Percés bartering the merchandise obtained from the traders for horses, ornaments, etc., with those nations. Late in the autumn some of them encamped near the fort but the greater portion kept in the fastnesses of the mountains, hunting in the valleys and bringing their proceeds to the trading post the following spring. About 6 months in the year the fort was left to defend itself the best way it could with its small number of men. These were further reduced when the mackinaw boats left with the annual returns. At these times those who remained could not with safety venture to the bank of the river to get water within a few steps of the gate. Indeed some were shot standing within the entrance. Whoever went forth to procure wood or meat placed their lives in extreme jeopardy. Every hunter there has been killed, and the fort often reduced to a famished condition when buffalo were in great numbers within sight. The few horses kept for hunting were always stolen, and those who guarded them shot down.

The Blackfeet never do these things openly; concealed among the bushes, grass, or in gullies they lie in wait for those who go out. The fort people seldom if ever killed any enemies. As soon as a man or two were shot the Indians absconded. At the time of attacking they were hidden from view or too numerous to be engaged by the few who were the victims to their bloodthirsty natures.

After keeping up the war in this way for about 16 years neither the Crow Indians nor traders could be brought to station themselves there for any length of time and the Yellowstone has been abandoned by both.[44] Men could, however, be found to continue operations in the Crow district did the trade prove of sufficient profit to the adventure. But two-thirds of the Indians have of late years taken their robes to the traders on the Platte for disposal. In some instances a few persons have come into their country with merchandise for their trade, which they brought in wagons along the Platte road as far as

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[44] Indian Agent Vaughan, on his visit to the Crow country in August 1854, reported, "Scarcely a day passes but the Crow country is infested with more or less parties of Blackfeet, who murder indiscriminately any one that comes within their reach. At Fort Sarpy so great is the danger that no one ventures even a few yards from his own door without company and being well armed" (Ann. Rep. Comm. Ind. Aff., 1854, p. 85). By spring of 1855, hostile pressure had become so great that the traders burned Fort Sarpy (May 19) and abandoned the Crow country (McDonnell, 1940, pp. 126–127). Thus, at the time of Denig's writing, his company had no post among the Crow. Vaughan was prevented from reaching the Crow in the summer of 1855 by bodies of hostile Sioux on the Lower Yellowstone. When he reestablished contact with the Crow in the summer of 1856, that tribe had not received Government annuities for 2 years. Their chiefs explained to him "they preferred to go without the goods, rather than run the risk of passing through a country beset by their deadliest enemies, the Blackfeet and Blood Indians of the north." Vaughan persuaded 350 Crows to go with him to Fort Union to obtain the annuity goods for the entire tribe (Ann. Rep. Comm. Ind. Aff., 1856, p. 81).

Laramie's Fork, thence turning off and passing the winter near Powder River Mountain. There they build houses, deal with the Crows, and take their returns of furs and skins to St. Louis by the same road they came. As the country now stands, it is destitute of traders. Some camps come to Fort Union for supplies, others go to the Platte posts, and many rove through the mountains, supply themselves with what they want either by barter with other tribes or by robbing any emigrants on their road to the far west.

The trade with the Crows never was very profitable. They buy only the very finest and highest-priced goods which are most desired for the horse trade. Their own clothing also, of European manufacture, consists chiefly of blankets, cloths, etc., which, with English guns and brass kettles, do not bear a large advance of price when sold to them. Add to this their interminable practice of begging and stealing, and the expense and risk in taking goods up the Yellowstone and peltries down, and but little remains to compensate the trader for his time and trouble.

FUTURE PROSPECTS OF THE CROW INDIANS

Situated as they now are, the Crows cannot exist long as a nation. Without adequate supplies of arms and ammunition, warred against by the Blackfeet on one side and most bands of the Sioux on the other, straying along the Platte trail where they contract rapid and deadly diseases, together with the unnatural customs of destroying their offspring, will soon lead to their entire extinction. Or if a few remain they will become robbers and freebooters on any and all persons passing through the solitary regions of the Rocky Mountains.[45]

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[45] At the time of Denig's writing the chances for the survival of the Crow Indians seemed slim, attacked on two sides as they were by the two strongest military powers of the Northern Plains, the Blackfoot and Teton Dakota. Yet Catlin had voiced a similar concern for the fate of the Crow in 1832: "They are a much smaller tribe than the Blackfeet, with whom they are always at war, and from whose great numbers they suffer prodigiously in battle; and probably will be, in a few years, entirely destroyed by them" (Catlin, 1841, vol. 1, pp. 42–43). Some of our aged Piegan and Blood informants, during the early 1940's, volunteered the opinion that had the U. S. Government not put an end to intertribal warfare, the Blackfoot and Sioux would have exterminated the Crow Indians.

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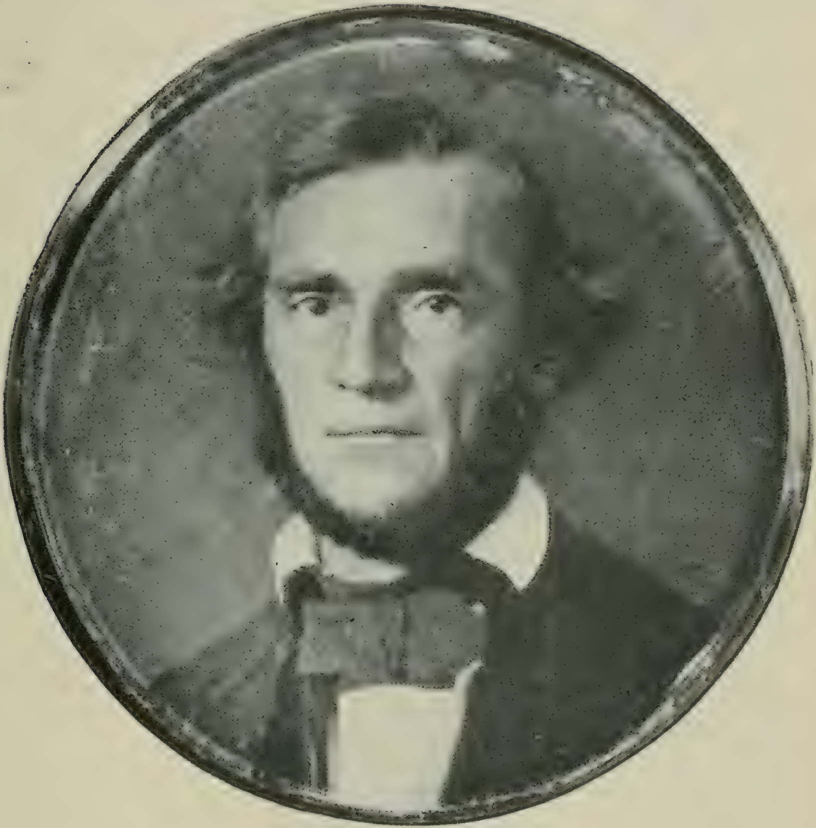
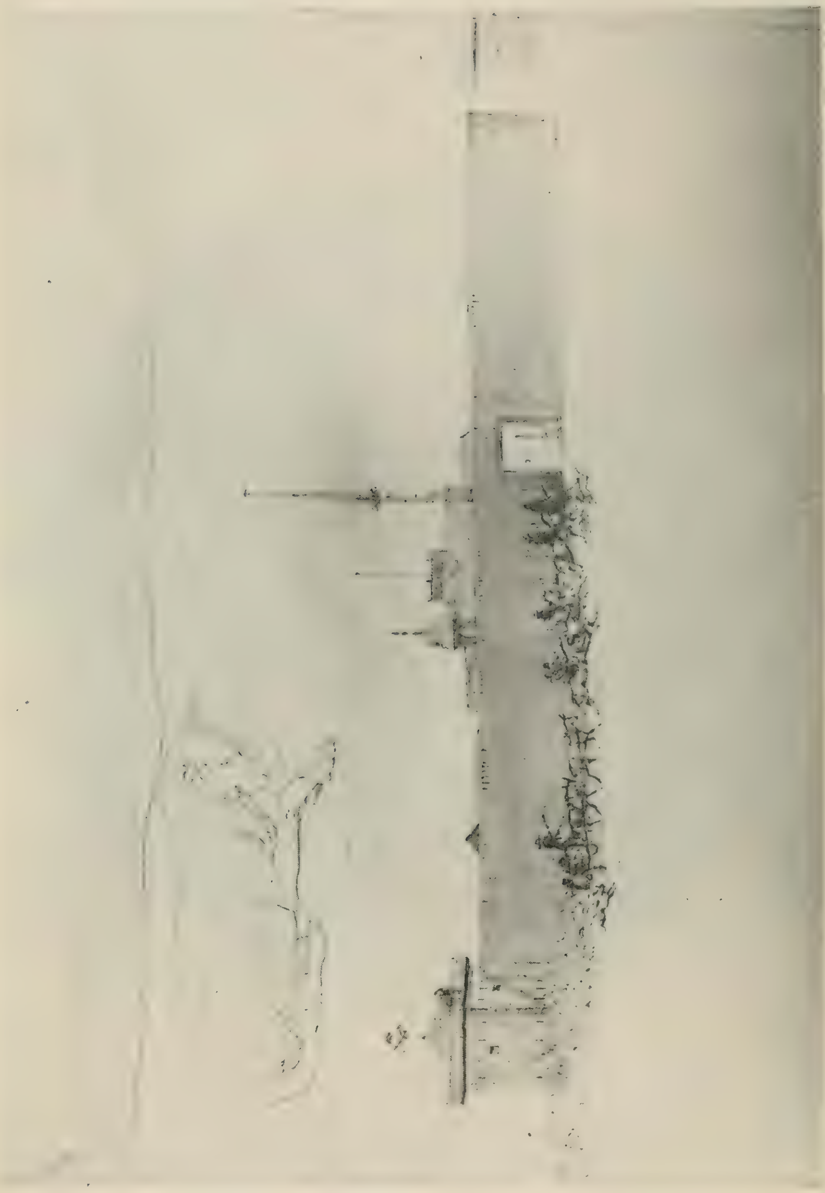
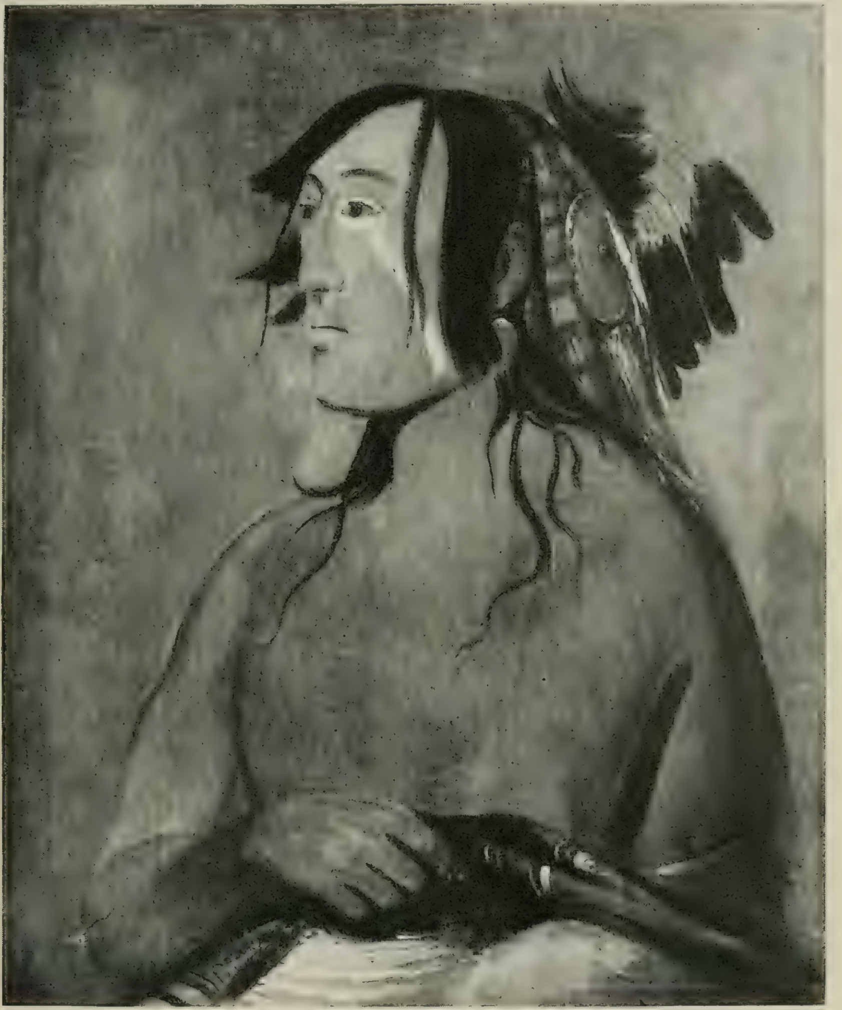


Portrait of Edwin Thompson Denig.

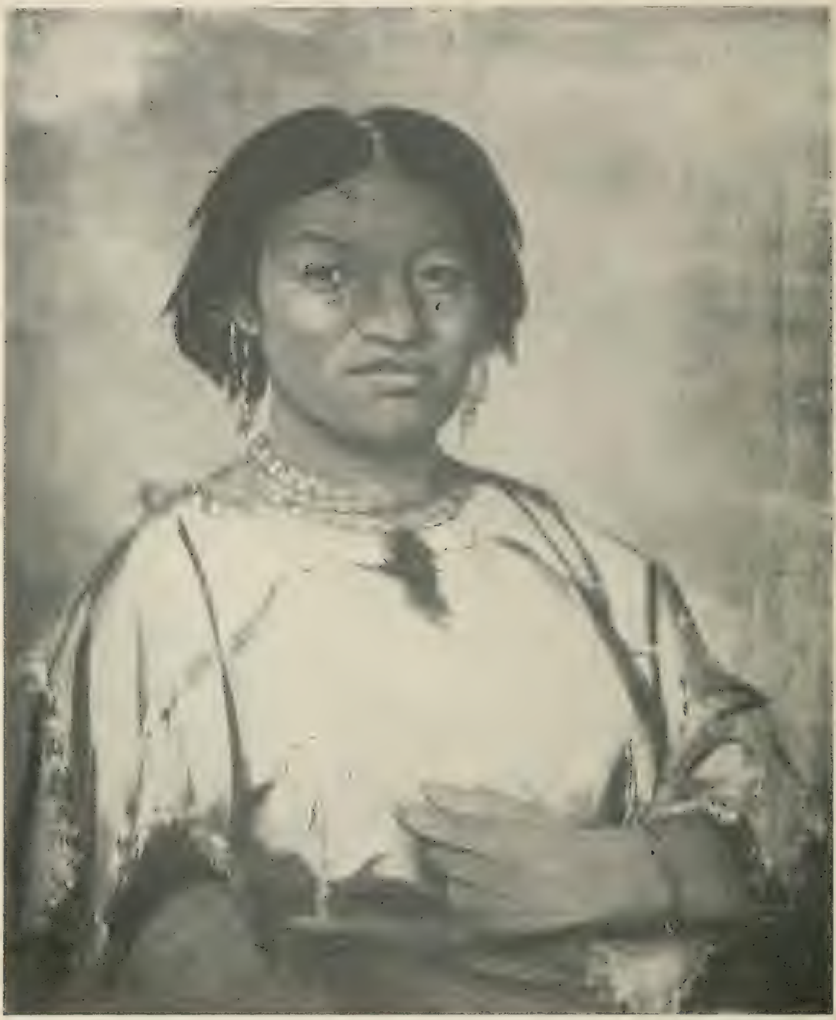


EXTERIOR VIEW OF FORT UNION, 1852.

(Sketch by R. F. Kurz.)

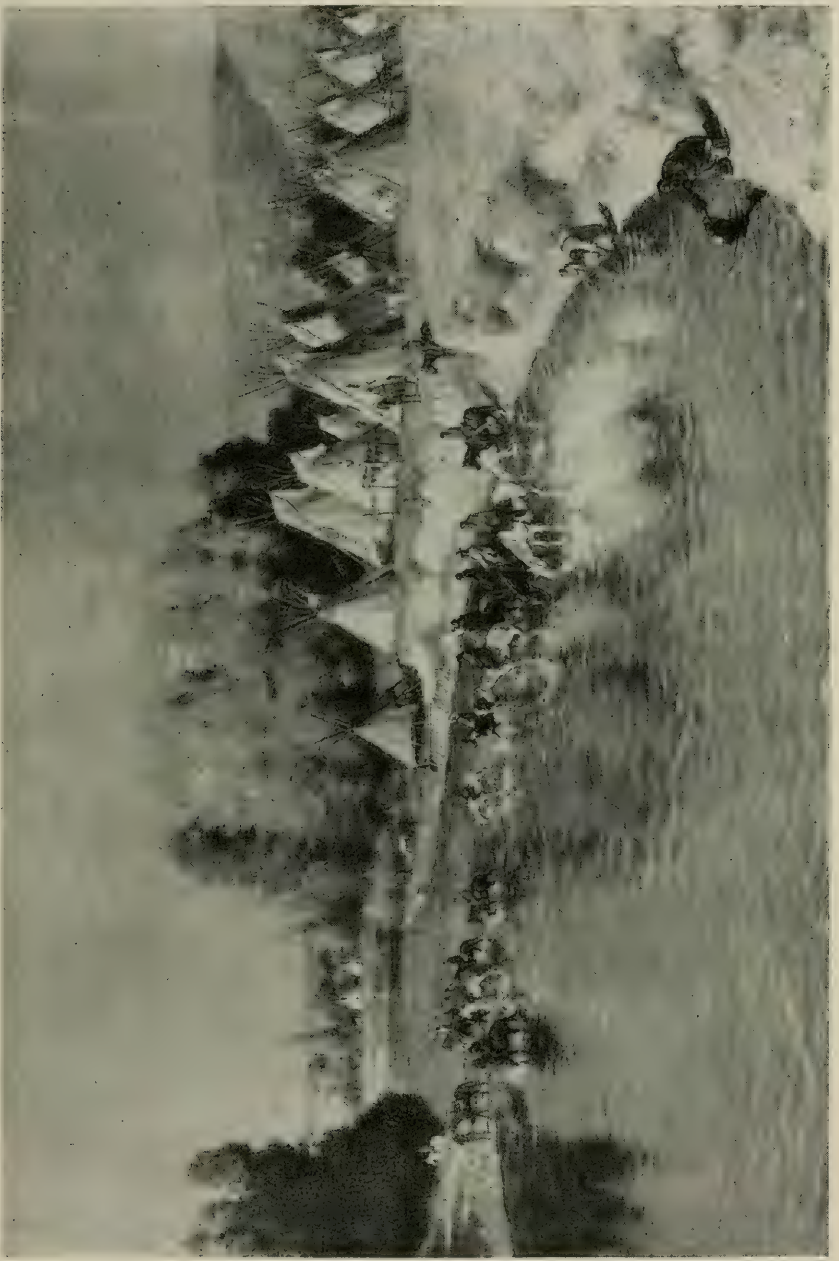


TWO CROWS THE YOUNGER, A CROW INDIAN.
(Painted by George Catlin at Fort Union, 1832.)



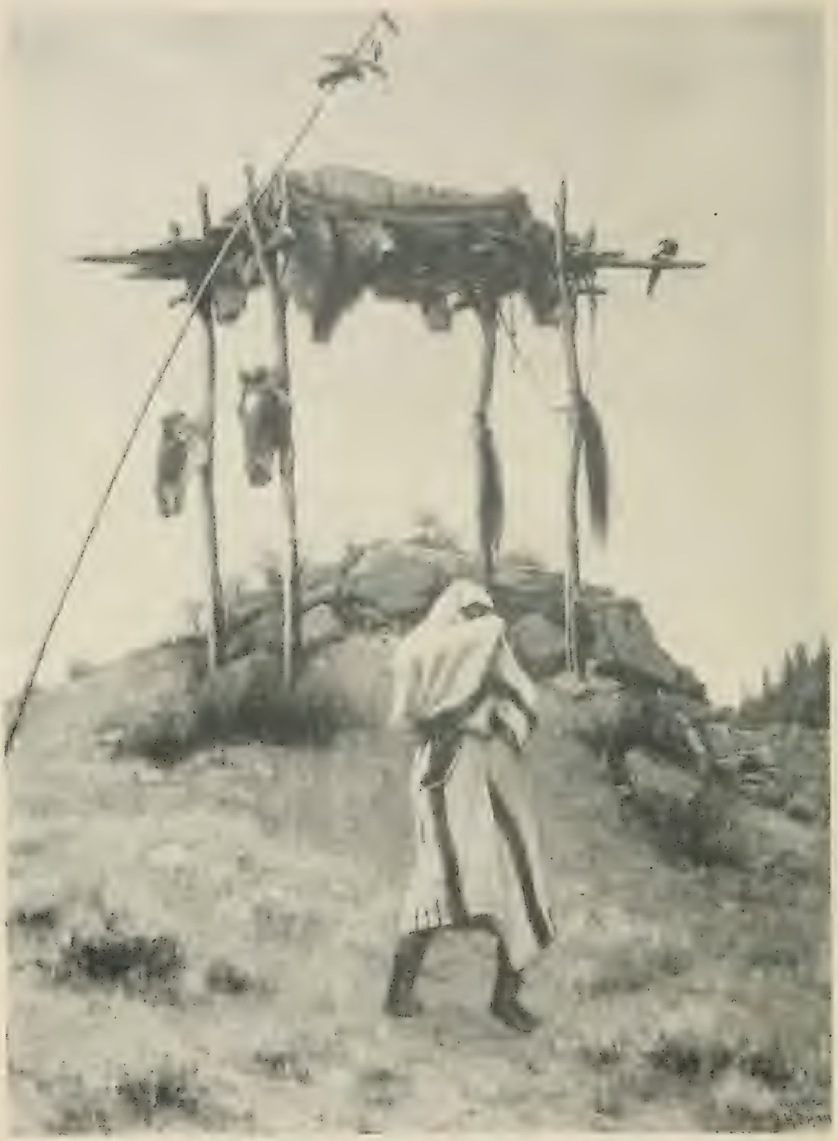
"THE WOMAN WHO LIVES IN THE BEAR'S DEN, HER HAIR CUT OFF, SHE BEING IN MOURNING."

(A Crow woman painted by George Catlin at Fort Union, 1832.)



CROW INDIAN ENCAMPMENT, LITTLE BIG HORN RIVER.

(Painting by J. H. Sharp, 1908.)



THE VOICE OF THE GREAT SPIRIT. A SCAFFOLD BURIAL ON THE CROW RESERVATION.

(Painting by J. H. Sharp, 1900.)

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The Water Lily in Maya Art: A Complex of Alleged Asiatic Origin

By ROBERT L. RANDS

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THE WATER LILY IN MAYA ART: A COMPLEX OF ALLEGED ASIATIC ORIGIN [1]

By Robert L. Rands

INTRODUCTION

Prominent among the art forms presented by Heine-Geldern and Ekholm in their highly suggestive paper on pre-Columbian trans-Pacific contacts are the lotus motif of Southeast Asia and the water lily of the Maya.[2] A number of specific resemblances in the depiction of the plants are cited. Broad temporal generalizations are made about the occurrence of the plants in the art of the two areas. The transmission of the lotus motif to Middle America is held to have taken place between A. D. 100 and 600, at the latest by the middle of the Classic Period, at which time it is known to occur in Maya art. Contacts are said to have been either intensified or renewed at the close of the Classic and the beginning of the Mexican Periods. It is only on this late time level, in Mexican Period art at the site of Chichen Itza, that the authors cite resemblances to the lotus in Asiatic art. The Hindu-Buddhist depictions of the lotus to which comparisons are made are likewise largely confined to a single site, Amaravati. Although this southeastern Indian site dates from the second century A. D., the existence of similar art forms on perishable wooden objects is postulated for a later period in the Malay Peninsula, Indo-China, and Indonesia.

It is not the primary purpose of the present study to continue this comparative approach. Even comparisons with floral designs elsewhere in Middle America will not be attempted, and any telling evaluation of the complex matter of possible Asiatic affiliations must obviously be made against such a background.[3] Also to be considered in a truly exhaustive investigation, but not touched on here, are the occurrences of similar floral motifs in portions of the Old World other than Southeast Asia (cf. Hamlin, 1916–23). Only Maya representations of the water lily will be analyzed in detail, in part with a view toward a better understanding of intersite relationships in the realm of religious design. Distributional and stylistic occurrences of water-lily-like plants will be noted, as well as the symbolic associations which characterize these art forms. It is apparent, however, that the material has a direct bearing on the problems raised by Heine-Geldern and Ekholm. This is especially true inasmuch as several of the highly arbitrary associations taken on by the water lily in Maya art are also present in Hindu-Buddhist representations of the lotus.

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[1] The writer wishes to express his appreciation to Miss Tatiana Proskouriakoff, the Division of Archaeology of the Carnegie Institution of Washington, and Dr. Gordon F. Ekholm, American Museum of Natural History, for their advice and suggestions. Most of the illustrations and much work on the tables were done by the writer's wife, Barbara C. Rands.

[2] Heine-Geldern, R., and Ekholm, G. F., 1951. These writers, although giving special emphasis to the water lily, discuss some fifteen to twenty additional traits common to Middle America and Southeastern Asia. Their paper, read at the 29th International Congress of Americanists, was supplemented by a special exhibit, "Across the Pacific," at the American Museum of Natural History. (Cf. Ekholm, 1950.)

FLORAL FORMS IN MAYA ART

GENERAL CONSIDERATIONS

To understand the place of the water lily in Maya art, it is first necessary to find criteria for identifying the plant. This has been done, in part, by previous workers. Maudslay (1889–1902, vol. 4, pp. 37–38), and after him such writers as Spinden (1913, pp. 18–20) and Lothrop (1926, pp. 159–162), have gathered examples of what has been termed the "fish and water-plant motif"—a flower at which fish is apparently nibbling. A few designs, patently similar but lacking the fish, have been tacitly considered to be water plants (Maudslay, 1889–1902, vol. 4, pl. 93–*g*, *h*, *m;* Spinden, 1913, figs. 2*a*–*c*, 4). Two or three atypical designs, to which, however, the mouth of the fish is placed, have been included in the group (Spinden, 1913, fig. 3*b*, *e*, *f*). Maudslay, while granting the resemblance of the group to the water lily, prefers the more noncommittal designation of "water-plant" (1889–1902, vol. 4, p. 37). Spinden speaks on several occasions of water-lily-like plants or of apparent water lilies. In his words, "Examples of the fish and water-plant design present much stronger proof of culture affinity among the cities where they occur than do the simple water-plant forms, for designs analogous to the latter are universal, whereas the association of fish and flower is very unusual" (Spinden, 1913, p. 18).

Whether or not these "analogous" designs represent the water plant is a problem of no easy solution. Resemblances to the flower of *Nymphaea ampla,* the large, showy, white water lily of the Maya, exist to varying degrees in a large number of designs. It is possible, as Maudslay indicates, that the water lily is the only flower depicted in Maya art (Maudslay, 1889–1902, vol. 4, p. 37). Nevertheless, the characteristics actually shared by flowers of various kinds may have led to a little-differentiated treatment of these flowers. Either the portrayal of a generalized flower, without any intention in the mind of the artist as to the type, or the portrayal of specific types which were so modified by artistic canons that their diagnostic features were lacking, might have been the rule.

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[3] A few words of exception must be made in the case of the frescoes of Tepantitla at Teotihuacan. Here, in repeated, standardized motifs, water-lily-like flowers and leaves emerge from the mouth of the rain god, Tlaloc. In this respect, as in others, the Tepantitla designs compare not only with Maya representations of the water lily but with Indian examples, as well. Correspondences of Teotihuacan floral art with that of the Maya are reenforced by a stela carving from the site of Copan, which shows a tripartite design, suggestively similar to the Tepantitla flower-and-leaf motif, placed identically at the mouth of a Tlaloc head (see Entry 49a of table 1). In view of such close relationships within Mesoamerica, the arbitrary scope of the present study, and the impossibility of basing definite conclusions on it, are apparent.

The identification of art forms as flowers tends, except for highly conventionalized designs, to be a fairly simple task. Not only is the over-all impression frequently well conveyed, but a number of design elements appear to represent conventionalizations of parts of the flower. For the most part these standardizations correspond well to the anatomical parts of the water lily, although certain of them might apply equally to other types of flowers. Thus, lines at the flower's top seemingly depict petals, two or three bands enclosing the central portion of the flower are probable sepals, and stamens—hidden by the petals if viewed from the side—may well be indicated by lines or dots. A more extended discussion of this type of evidence is given below in a classification of floral forms in Maya art. Occasionally, however, rounded tufts of feathers or down may be confused with the petals of a flower. Ends of the long bones may also be conventionalized in such a way as to approach certain stylizations of the flower. These deviant occurrences are rare, however, and as a preliminary approach to the problem of the water lily it is possible to isolate a large number of floral forms. This has been done in table 1.

For the most part, these flowers segregate into standardized types. These categories are based on combinations of the over-all shape with certain elements of the sort just cited. Additional elements tend to unite the group. Two or three of the types appear as the food of fish in the fish and water-plant motif. Their occurrence in other situations suggests that the same plant is intended. Occasionally more than one category of flower appears on a single stalk or creeper. This would seem to imply that more than one way of depicting a single kind of flower existed, but it may mean instead that various sorts of flowers, water lilies and nonwater lilies, were grouped together into a composite entity. A corollary of this would be that different artistic types represent different kinds of flowers. Yet again, many of these differences may indicate different stages in the unfolding of the flower, or different portions of the plant may sometimes be shown.

Apparently more diagnostic than the flower, the water-lily leaf is characteristically treated in Maya art. The notched, unevenly surfaced leaf of *Nymphaea ampla* seems to be recaptured in a cross-hachured design that sometimes accompanies flowers and stalks. It occurs in connection with the fish and water-plant motif, with flowers of the type that appears in the fish and water-plant motif, and with flowers of different types. It offers strong support to the feeling that there is at least an ingredient of the water lily in a great many floral designs in Maya art.

Striking features recur in the stalks of plants that are present with the fish and water-plant motif, the probable water-lily leaf, and flowers of the types that commonly appear in the fish and water-plant motif. The stalk takes on a scrolled, often vinelike or creeperlike quality. Panels and panel variations occur. The same characteristics appear again in connection with additional categories of flowers, suggesting that the same plant is portrayed. If these plants actually are not the same, surely they have imbibed strongly of the same artistic tradition!

The presence of stems or vines worked into a scrolled or undulating panel is especially important insofar as the present study bears on the problem of trans-Pacific contacts. For, as pointed out by Heine-Geldern and Ekholm, the same unnatural treatment is prominent in Hindu-Buddhist depictions of the lotus. Therefore, if nonwater lily plants are given this treatment in Maya art, they may provide a prototype or artistically related form and cannot be ignored. Stalks of this sort, without accompanying flowers or leaves, are accordingly included in table 1.

It is apparent, then, that while there may be no clear-cut answer to the question of the identification of the water lily, many art forms share features which suggest that they are possible water lilies. These linking features are not merely artistic but consist of the symbolic situations in which the plants occur—the mythic beings they contact and the anatomical portions of the beings from which they emerge. This being the case, the study of the water lily must be extended to include plant forms which share this complex. Conceivably, if the complex is shared by plants other than the water lily, it could have originated with the water lily or with some other plant and spread to flowering plants in general, or it could have grown up around undifferentiated plant life. It is the writer's belief, however, that water-lily plants form the central core of the complex, perhaps, in some cases, in conjunction with the maize plant. Whether or not this is true may be of importance so far as the details of Maya religious symbolism are concerned but would not appear to bear too importantly on the problem of intersite connections. Nor is it of fundamental importance to the problem of connections with the lotus in Indian art. The case for such connections is based largely upon the similarities in art form and the highly arbitrary nature of the plant's associations. The artistic resemblances are just as great and the associations as arbitrary whether the water lily or some other plant happens to be depicted in a given instance.

Based on these considerations, floral and stem forms that occur in Maya sculptures and murals have been gathered together without implication that the water lily is necessarily depicted (table 1). The compilation of these representations cannot claim to be exhaustive, but, subject to the occasional error of misclassification that is inherent in working with a complex art form and with sometimes badly eroded and poorly illustrated material, it probably begins to approach that goal. Compilation of floral forms in the glyphs is incomplete. Unpublished material is not included. Likewise omitted are certain forms lacking any of the associations characteristic of the "water lily" complex. Especially to be noted in this connection is the wealth of floral designs at Chichen Itza, particularly at the Temple of the Xtoloc Cenote (Proskouriakoff, 1950, fig. 108c). A middle course has been followed in the tabulation of stylized or flamboyantly treated designs which have definite floral attributes. Some leeway is given, although the more conventionalized ones have been passed by. Untabulated, too, are certain treelike forms and probable maize plants which share an important characteristic of the complex, viz, growth from the head of a mythic being.

Comparative material from ceramic and codex art is also tabulated. These data are not to be considered as necessarily representative, however, for only floral or stem forms having artistic or associational features of special interest are included. The figure painted vases are especially rich in untabulated floral designs. Thus, a vessel for which only 1 flower is tabulated also displays 16 additional flowers worn in the headdresses of the 5 pictured figures (Entry 213 of table 1)!

It seems probable that some nonwater lilies are included in table 1, and ratings of A and B are given as an indication of the relative likelihood that a given depiction was intended as a water lily. Although these ratings are impressionistically arrived at, they take into consideration such factors as the resemblance to an actual water lily, the degree of stylization (which, if great, might suggest that the motif was employed without especial consideration for its original concept), the associations of the plant form (which may build into a number of crosscutting complexes, some of a highly specific order), the resemblance to other flower representations which enter into such complexes, and the indistinctness of the sculpture or illustration. To some extent, then, the ratings reflect not only whether the representation is a water lily but to what extent the concept of the water lily was probably present. The ratings are arbitrary in that they represent no real clustering into distinct levels, and the device of minus signs has in some cases been employed to further subdivide the A category.

WATER-LILY LEAF

The leaf, as has been indicated, is one of the most characteristic features of the water lily in Maya art. Maudslay especially noted the water-lily-like appearance of the leaves on his so-called "water-plants" from Palenque (Maudslay, 1889–1902, vol. 4, p. 37). Comparison of these forms with *Nymphaea ampla* reveal striking likenesses, in spite of an impressionistic treatment (cf. Lundell, 1937, pls. 9, 12). Maya treatment of the water-lily leaf typically takes the form of some combination of the following conventionalizations:

Elements of Maya Treatment of the Water-lily Leaf

Element *a*. An irregular, sometimes wavy crosshachure suggests the roughened appearance of the water-lily pad (figs. 1*b*, 3*f*).

Element *b*. Crosshachure occurs but is of a regular, even type (fig. 3*c*).

Element *c*. Dots occur within the crosshachures, adding, perhaps, to the roughened appearance of the design (figs. 1*b*, 3*f*, *g*).

Element *d*. A solid block of dots marks the surface of the leaf (Ruppert and Denison, 1943, fig. 51*c*).

Element *e*. Crossed bands form the interior marking (fig. 2*d*).

Element *f*. The outline of the leaf is notched or serrated, deeply (fig. 6*d*) to lightly (fig. 1*b*). The occurrence of squarish protuberances is characteristic (figs. 2*d*, 3*g*, 6*g*).

Element *g*. Ideally, a raised band outlines the margin of the leaf. Viewed in profile, the edge of the leaf flares upward and outward, with or without a distinct band resulting (figs. 6*c*, *d*, 1*c*). Or raised bands only may occur (fig. 3*f*). Regarded as a variant of the ideal form, an unraised band separates an area of interior marking from the edge of the leaf (fig. 4*a*).

Element *h*. An apparently raised band, more narrow, regular, and rounded than in *g*, occurs toward the interior of the leaf (figs. 4*a*, 5*e*, 6*g*).

Element *i*. A row of dots outlines the margin of the leaf (Lothrop, 1924, pl. 7).

Element *j*. Inner markings at the center of the leaf pass outward to the margin (or marginal band) (figs. 1*b*, 3*f*–*h*).

Element *k*. The markings are restricted to an area well toward the center of the leaf. This area would seem to correspond to that of Element *h* (fig. 6*b*).

Element *l*. Aside from bands, no interior markings appear (figs. 4*a*, 5*e*).

Element *m*. Angular, notchlike elements, resembling a slightly curved V, pass outward. They may lead outward from a marginal band into the protuberances of the leaf as semi-independent entities (fig. 1*c*). The marginal band may assume this shape as it juts outward, following the contours of the leaf (fig. 1*b*). Interior markings may take on this form (fig. 3*b*). As a probable variant, small straight lines pass outward into the marginal band in the same way but lack the V-shape (figs. 3*g*, 6*c*). The relationship of this set of closely related forms to Element *f* is intimate.

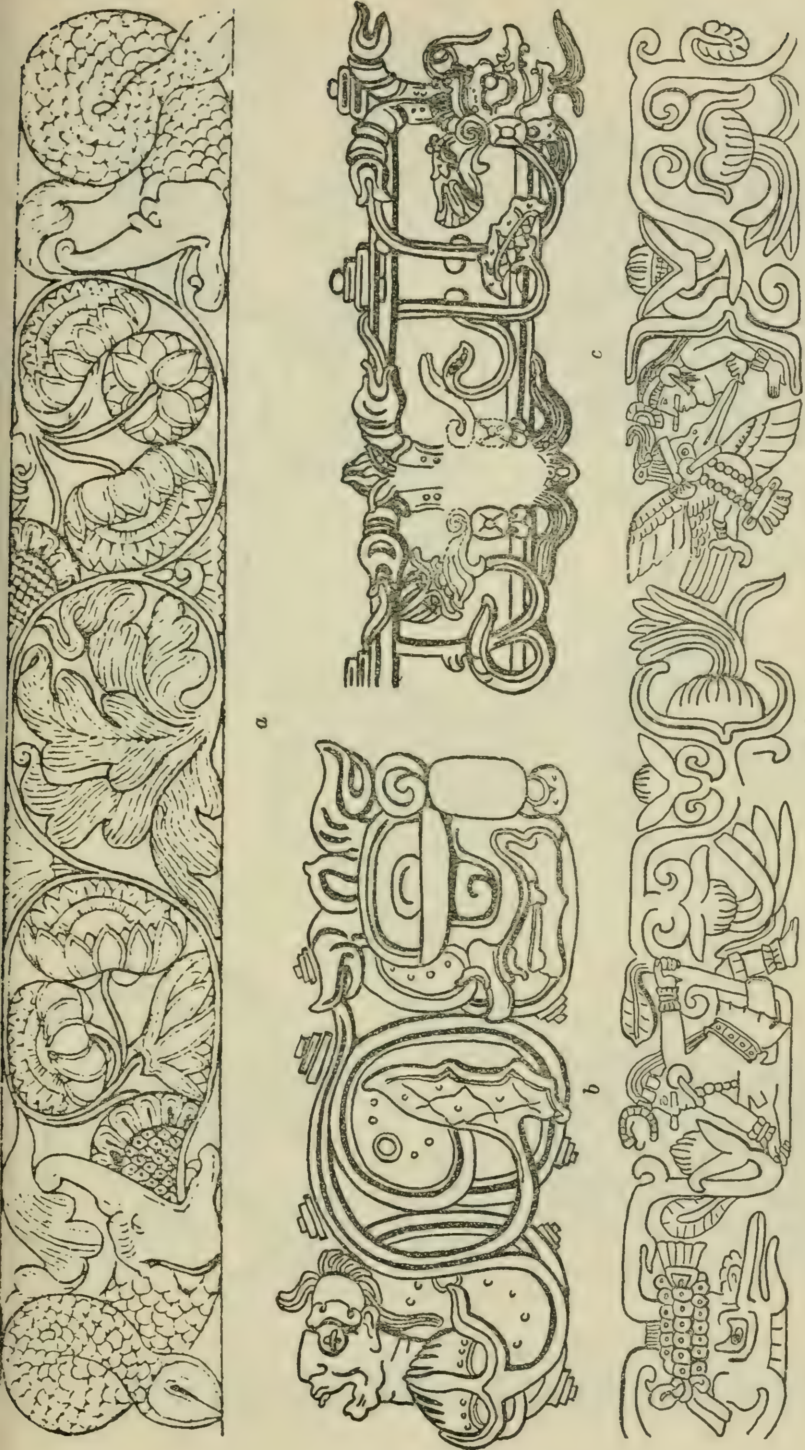

FIGURE 1.—*a*, Amaravati, India. *b*, *c*, Palenque (Entries 78, 77). *d*, Chichen Itza (Entries 25, 26).

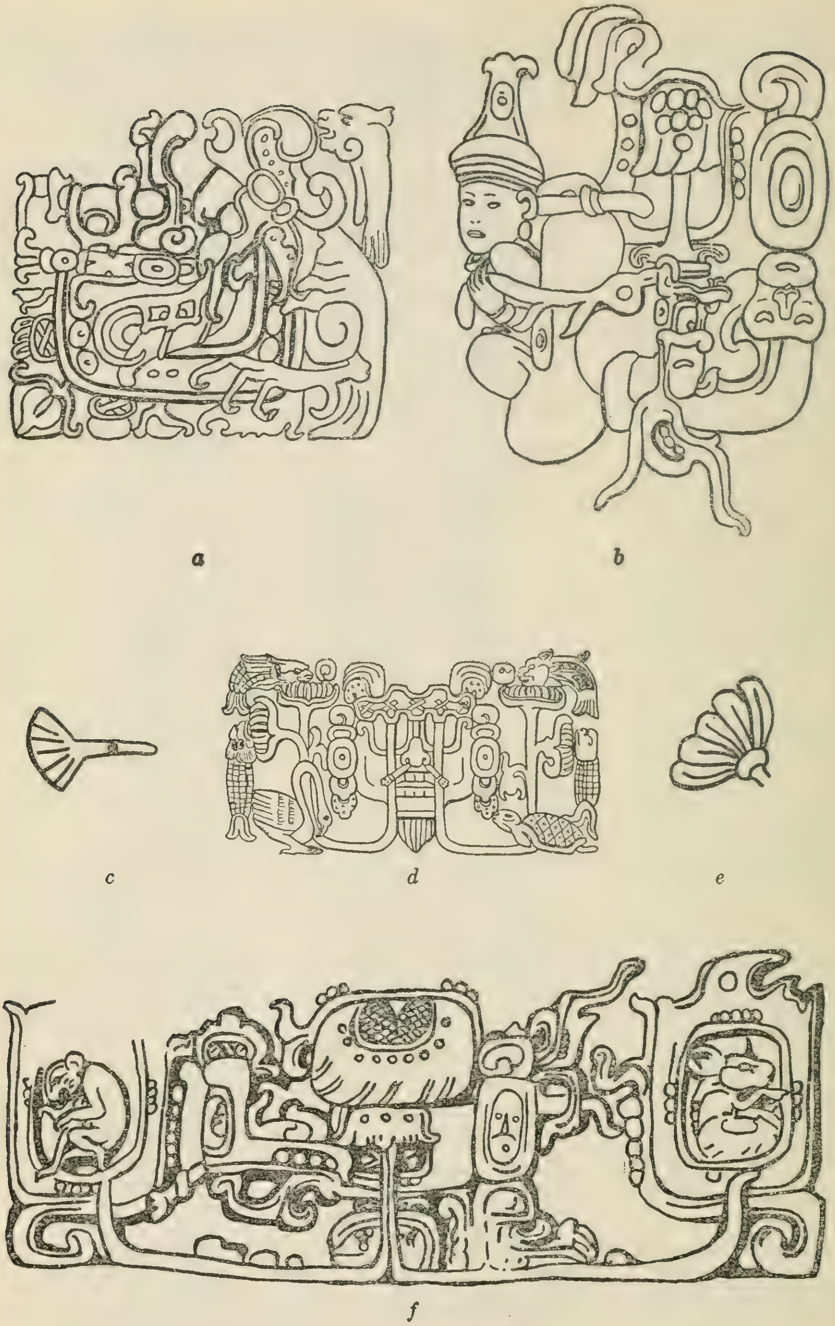

Figure 2.—*a*, Quirigua (Entry 104). *b*, Copan (Entry 50). *c*, Chama (Entry 204). *d, e*, Chichen Itza (Entries 22, 28). *f*, Yaxchilan (Entry 152).

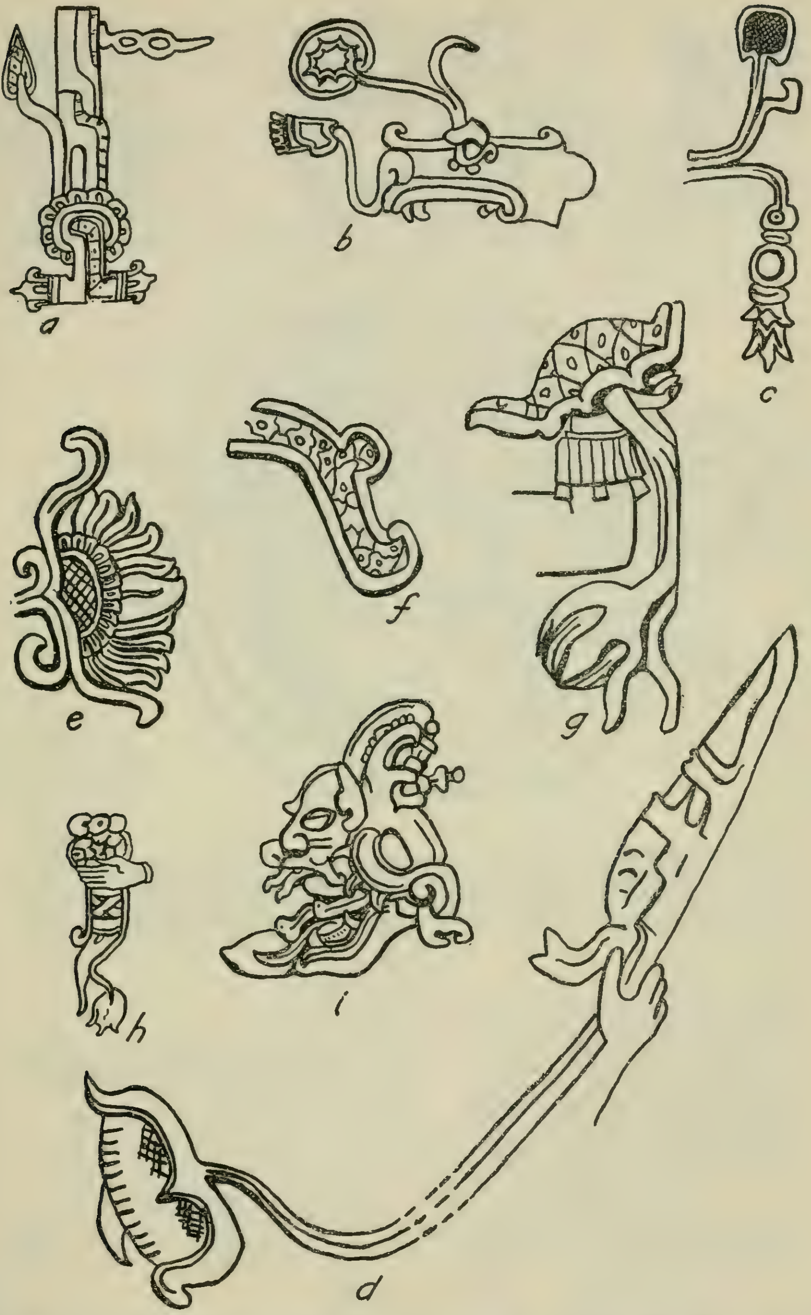

FIGURE 3.—*a*, Santa Rita (Entry 121). *b*, *c*, Tulum (Entries 129, 131). *d*, Yucatan (Entry 221). *e*, Chichen Itza (Entry 23). *f*, Quirigua (Entry 118). *g*, Palenque (Entry 76). *h*, Dresden Codex (Entry 301). *i*, Tikal (Entry 124).

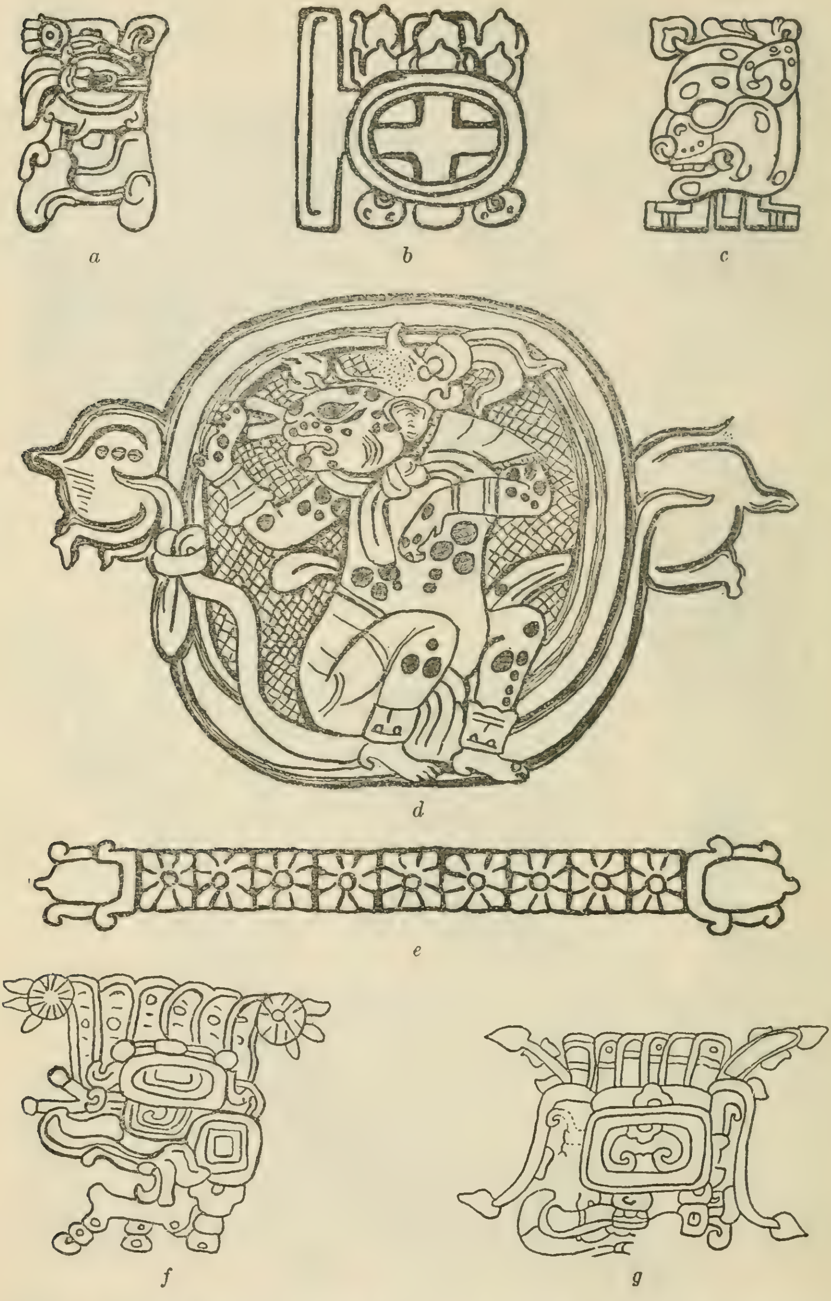

Figure 4.—*a*, *b*, Palenque (Entries 69, 91). *c*, Copan (Entry 44). *d*, Yucatan (Entries 219, 220). *e*, Chichen Itza (Monjas). *f*, Rio Hondo (Entry 214). *g*, Kaminaljuyu (Entry 211).

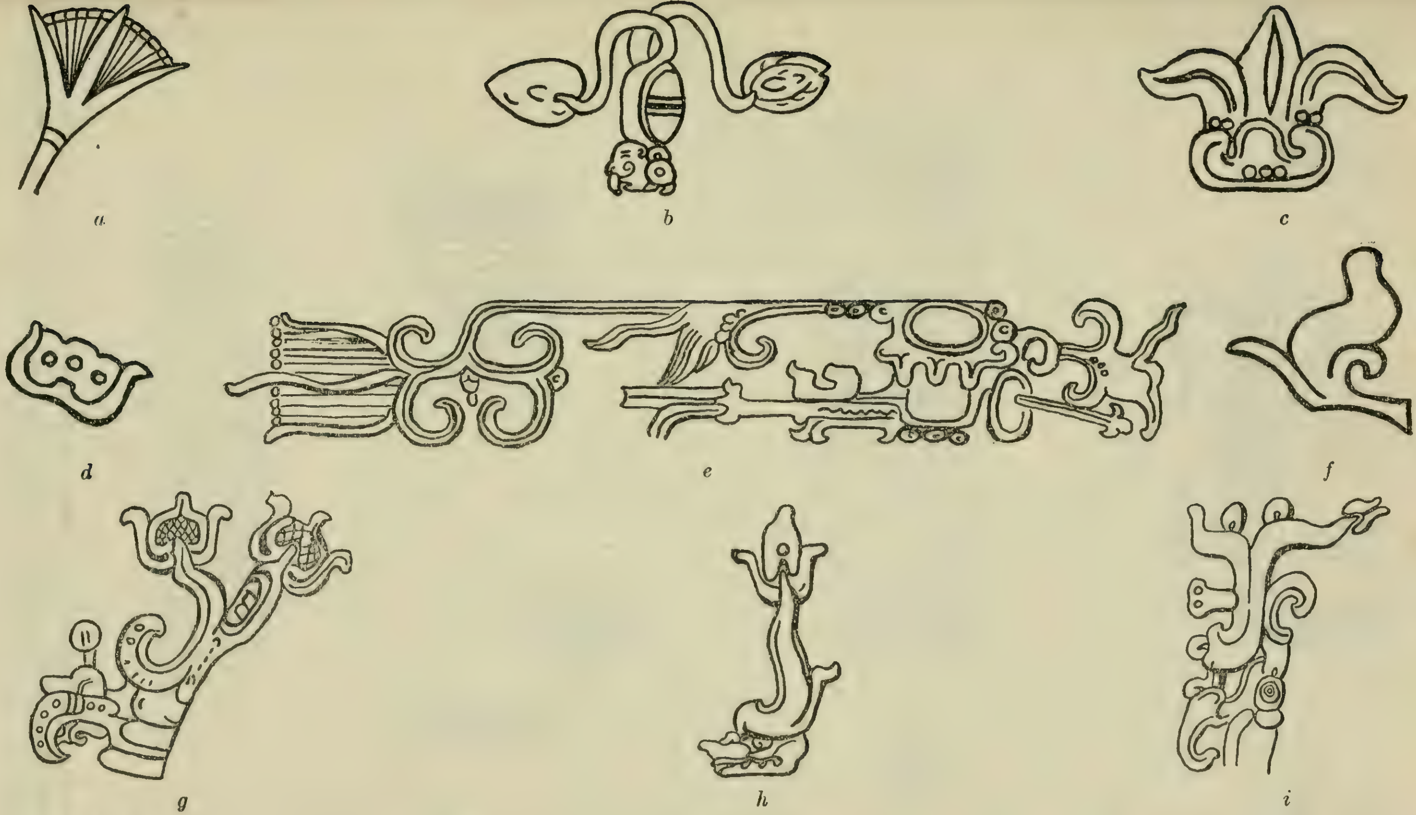

FIGURE 5.—*a*, *i*, Chichen Itza (Entries 35, 29). *b*, Río Hondo (Entry 215). *c*, *h*, Palenque (Entries 71, 73). *d*, Quirigua (Entry 117). *e*, Chajcar (Entry 208). *f*, *g*, Chama (Entries 203, 201).

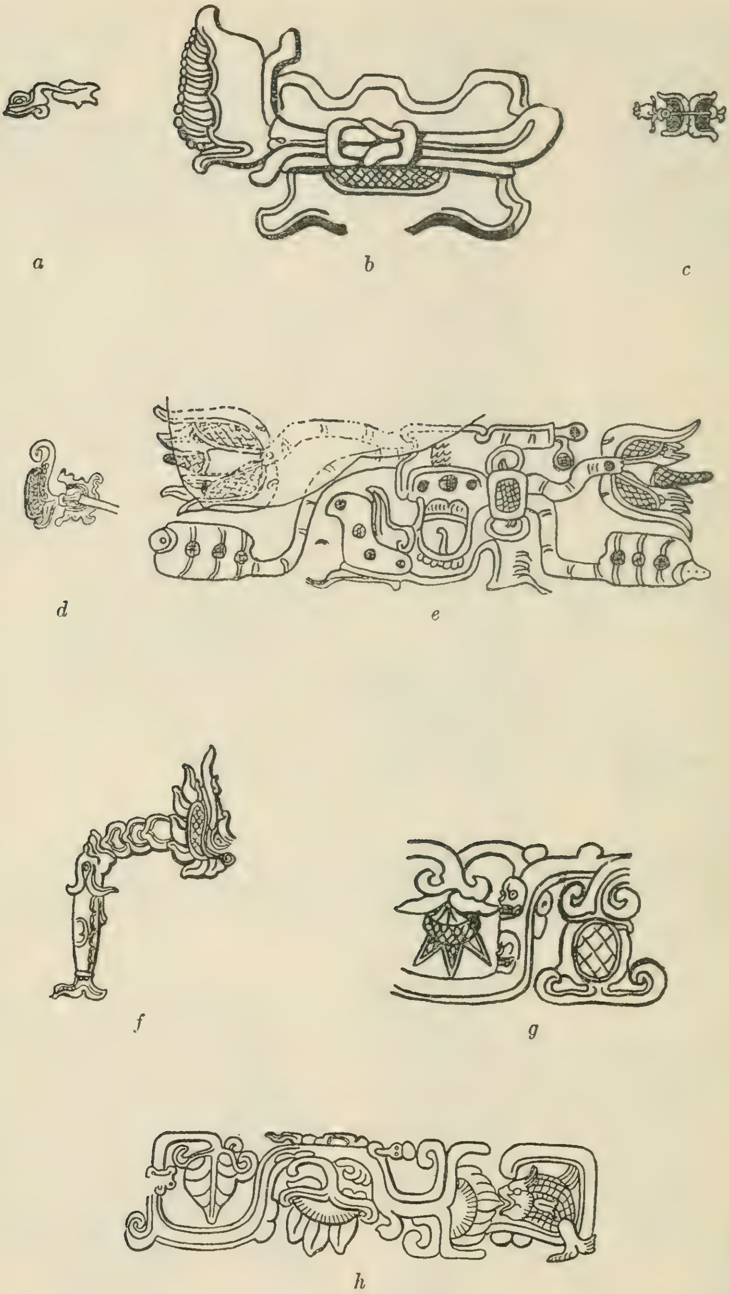

FIGURE 6.—*a*, Quirigua (Entry 111). *b*, Copan (Entry 53). *c*, Dresden Codex (Entry 310). *d*, La Amelia (Entry 63). *e*, Vase (Entry 222). *f*, Palenque (Entry 70). *g*, *h*, Chichen Itza (Entries 27, 24).

Some of these elements, such as raised marginal bands and marginal dots, are stylistic traits of wide occurrence in Classic Maya art, while crossed bands also occur widely. Other elements, such as the notchlike forms, are more distinctive. The occurrence of dots in wavy cross-hachure is an unusual combination, but recurs in representations of the turtle shell (fig. 2*d*, and pp. 17a, 70b, 71a, 72b of the Madrid Codex). The leaf outline tends to be squarish to rectangular and is marked, as noted, with serrations and bumpy protuberances. The over-all configuration, caused by repeated appearance of the enumerated elements with this distinctive outline, stands out sharply in Maya art. Its unique quality is underscored by its almost universal association with floral forms.

The occurrence of the artistic elements *a* through *m* is summarized, according to site, in table 2. Numerals refer to the number of water-lily leaves having a given trait. The large number of elements present at Palenque reflects the unusual number of representations depicting leaves at that site. Furthermore, Palenque, more than any other site, seems to possess these traits in their most "ideal" form. That is, for such traits as elements *m*, *a*, and perhaps *c* and *f*, the Palenque delineation seems either to represent a central trend around which the other sites tend to vary in different directions, or else the variation within one of these other sites points to less standardization than at Palenque in regard to these elements. The point is a vague but suggestive one. It may mean either that Palenque seized on certain generalized artistic attributes of the water-lily leaf and elaborated them in its own distinctive ways or that Palenque was actually a source of inspiration and diffusion for these particular treatments.

Two types of water-lily leaves may be recognized. One comprises most of the Palenque examples (Entries 68, 76, 77, 78 in table 1,[4] figs. 1*b*, *c*, 3*g*). One of the Quirigua leaves (Entry 118, fig. 3*f*) compares notably in interior marking but varies in shape. The other group, to be discussed below in connection with the Over-all Type IIc, occurs at Bonampak, Chajcar, Calakmul, Ixkun, La Amelia, La Mar, Palenque, Quirigua, Yaxchilan, and perhaps in the Dresden Codex. As indicated, transitional features are numerous and the entire body of representations quite standardized.

No Early Period representations of the water-lily leaf are definitely known to occur. The leaf appears in House C, Palenque, as glyphs in the inscribed stairway, forming part of a 9.8.9.13.0 Initial Series, and recurs as a stucco decoration on the inner wall of the West Corridor (Entries 68, 69, fig. 4a). While this suggests a rather early presence of the motif, the dating of Palenque is far from securely placed, and it is probable that these representations are considerably later. The chronological position of other water lily forms at Palenque is likewise unsure. One of the earlier water-lily leaves is on Stela 8, Piedras Negras (Entry 95), bearing a probable 9.14.15.0.0 inscription.

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[4] Since all Entry numbers are from table 1, future references to specific Entries will omit table number.

FLOWER TYPES

Contrasting somewhat with the standardization of the water lily leaf, a great diversity exists in the representation of the floral forms included in the tables. As suggested above, this may imply that non-water lilies have been included. However, even the flowers united by the fish and water-plant motif display marked variation.

In considering the water-lily flower, 18 types, A through R, are recognized. Portions of the plant other than flowers may be included in a few instances. The types fall into five major groupings. The latter are based on whether or not the flower is shown in profile (the almost universal rule) and on the presence or absence of petals and sepals. The types are more specific and more finely calibrated than the groups.

GROUPS AND TYPES OF MAYA TREATMENT OF THE FLOWER

Group I. Both petals and sepals are indicated; the flower is in profile.

Type A. The form of the flower's top tends to be rounded to subtriangular in shape and occasionally takes on a slightly mammiform appearance. Zoning of the interior, which perhaps indicates stamens, is largely confined to this type (fig. 1*b*, *d*).

Type B. The flower is more widely opened than in Type A. Top and base are essentially flat. The width is great, the height small (fig. 2*d*).

Type C. Unlike the other categories in Group I, the flower flares out widely toward the top, which is gently rounded. The form is highly symmetric and standardized. Sepals tend to taper toward the end; petals may terminate just short of the top, a crescent of marginal dots resulting (fig. 5*a*).

Type D. As in Type B, the flower has a flattish base and top, but it is elongated, being long in comparison to its width. In this it would correspond more nearly to Types A and C (fig. 5*e*).

Type E. As in Type B, the flower tends to be flattish and squat, but it is probably the most distinctive of the types comprising Group I. Two qualities set it apart. One is its greatly thickened sepal. The second is its asymmetry, for not only does a thick sepal pair off with a narrow one, but the stem tends to be attached at a corner of the flower, rather than being placed beneath its center (fig. 6*b*). Flowers showing just one of these traits are regarded as variants of the type (fig. 6*d*). In pure form the type often is further characterized by the occurrence of a row of marginal dots (cf. Type C) and by a serration of the edge of the thickened sepal in the way characteristic of water lily leaves.

Group II. Sepals but not petals are definitely indicated; the flower is in profile.

Type F. A wavy to jagged outline, enclosed by the sepals, gives a suggestion of petals. To this extent, the type seems transitional to Group I (fig. 5*d*).

Type G. A shallow central area, probably indicating undifferentiated petals, is set between sepals (Maudslay, 1889-1902, vol. 2, pl. 14, No. 13).

Type H. A rather wide, swollen central element rises beyond the enclosing sepals. Frequently this central element is of mammiform shape (figs. 4*e*, 5*g*).

Apparently the central element usually represents undifferentiated petals, but its upward-jutting tip may sometimes indicate the rise of a third sepal. This interpretation would not be favored by the close resemblances to the mammiform but sepalless Type M. Type H, furthermore, tends toward uniformity.

Type I. A number of forms are subsumed under this catch-all heading. They have in common the feature of a central element not well differentiated from the two enclosing outer ones. In this they contrast with Type H, where the distinction between inner and outer elements is well marked. The inner element of Type I flowers is characteristically narrow. The partial unfolding of a flower may be indicated. In its frequently jagged appearance, the type seems transitional to Group III flowers, especially to Type J. Sometimes a fleur-de-lis shape is approached (fig. 5*c*).

Group III. Petals and sepals are undifferentiated; the flower is in profile.

Type J. The flower is outspread. Straight lines may separate the petals or sepals (fig. 2*c*), semi-independent bands, rounded at the end, may be shown (fig. 2*e*). Especially in the former case, the flaring shape and slightly rounded top compare suggestively with Type C flowers.

Type K. Unlike Type J, the flower is unflaring and straight in its lines. The petal or sepal lines, which tend toward shortness, are straight. The length is usually great in comparison to the width (fig. 3*b*). An angular type of basal zoning, consisting of parallel horizontal lines, frequently occurs.

Type L. The flower is partially outspread; rounded and waved petal or sepal lines occur. To some extent the type is transitional to J and K; it has analogies to Type F but lacks definite sepal bands (fig. 6*c*).

Group IV. Neither petals nor sepals are indicated, and these absences suggest that a leaf or pod rather than flower is indicated. Unopened buds may be represented in some cases. Depiction is in profile.

Type M. The shape is mammiform, thereby corresponding to Type H flowers, but enclosing sepals are absent (figs. 4*c*, 6*f*). An unopened bud may be indicated, or perhaps a leaf.

Type N. The design is leaf-shaped (figs. 3*i*, 4*g*). Together with Type M representations, it occurs on possible trees in the Maya codices (Dresden, 27ff). A design on a vase from the Rio Hondo (Entry 215, fig. 5b) suggests, however, that the form may also depict an unopened bud. Here a Type N object is attached to a curving stem. A second stem from the same source terminates in a similarly shaped form, but in this case a cleft tip and interior markings clearly indicate the partial unfolding of the petals or sepals (fig. 5*b*). Gann identifies the objects as water lily buds (Gann, 1918, p. 110).

Type O. The design is elongate and paddle-shaped. An interior area, often lonzenge-shaped, is frequently set off, and small lines run out to the margins (fig. 1*d*).

Type P. The design shows similarities to Type O but assumes a constricted shape, small circles being enclosed in the wider portions of this highly elongate form. A seed pod of some sort is suggested (fig. 3*a*).

Group V. The designs are not shown in profile.

Type Q. A composite flower seems indicated, as if viewed in part from the top and partly from the side. Undifferentiated sepals or petals jut out from a circular or semicircular base (figs. 3*c*, 4*a*, *f*, 6*g*, *h*).

Type R. The flower is viewed from the top. Lines suggesting petals or sepals, or concentric rings of lines, suggestive of stamens, petals, and sepals, radiate outward (fig. 4*e*).

The Group I forms not only tend to be the most realistic flowers but are the ones most frequently associated with the fish in the well-known fish and water-plant motif. They offer, therefore, the best initial basis for an identification of art forms as water lilies, in terms of the treatment of the flower alone.

Groups IV and V tend to be set off somewhat from the others. Specific features link several of their types to those in the other groups, however. Type Q flowers with semicircular bases occur on stems in connection with Type A flowers and flower-eating fish at Chichen Itza (Entries 24, 27; fig. 6*g*, *h*). Type Q flowers with circular bases but otherwise of closely corresponding appearance also occur on Xultun stelae (Entries 139, 140) and on a Río Hondo bowl (Entry 214, fig. 4*f*). In the latter case, mouths of fish are placed against the projecting petals or sepals, tending independently to support the identification of the form as a water lily. Analogous forms occur in the Tulum frescoes, in connection with probable water lily leaves as well as with Type K flowers and Type P seed pods.

Type P pods are not as directly linked with Group I, II, or III designs. Forms apparently transitional to Types O and P occur, however, on a twisted stem pictured in the Madrid Codex (Entry 314). The paddle-shaped Type O designs occur on one of the more surely identified water-lily stems at Chichen Itza (Entry 25, fig. 1*d*) and recur on corresponding stems elsewhere at the site (Entries 28, 32, 35). On one of these stems (Entry 32), the similar but constricted Type P seed pod also appears. These forms seem definitely to be associated with the same type of stem on which water lilies occur.

A Type N-shaped design, tabulated also as a water lily leaf, appears on the same stalk as a Type P pod in the Santa Rita frescoes (Entry 121, fig. 3*a*). An unopened leaf may be indicated, for the design in question bears such characteristics of water lily leaves as dots in connection with crosshachure.

Type M designs, of Group IV, bear close resemblances to the mammiform but unsepaled Type H forms of Group II. These, in turn, are linked to the petaled and sepaled Type A representations of Group I by the slightly mammiform appearance which frequently characterizes the latter and by a design on a Yucatan vessel (Entry 220, fig. 4*d*). Two mammiform flowers, of closely corresponding appearance, occur on a single knotted stem. One of the flowers lacks petals and is therefore to be classified as Type H; the other, with a few lines scratched in, is thereby Type A. In the same way, on the Bonampak murals, where color sometimes differentiates petals from sepals on the highly realistic water lilies, the filling in of petal lines seems to be a somewhat inconsistent, almost whimsical, matter of choice (Entries 8–12).

The mammiform Type M designs, while probably portraying buds or leaves, show certain resemblances to Maya representations of serpent rattles. This is particularly true in figure 6*f* (Entry 70), where the designs are so attached as to form a dangling, chainlike object (cf. Maler, 1901, pl. 18, No. 2; Morley, 1937–38, vol. 5, pl. 139*a*). Elsewhere, however, flowers lacking this rattlelike appearance seem to be somewhat similarly attached (Entries 17, 151). The representations of Entry 70 seem, moreover, to be examples of the fish and water-plant motif, for the nibbling fish appear, their mouths placed against the Type M designs.

Occurrences of the Flower Types are summarized, according to site, in table 3. Numerals refer to the number of flowers. Chichen Itza, with its vast array of flowers appearing in panels along the walls of several structures, has a wide variety of floral categories. Significantly small totals for this site appear only in connection with the asymmetrical Type E and the mammiform Types H and M. It should be noted in this connection that the slightly mammiform treatment of Type A flowers is fairly prominent at Chichen Itza, and that Type A is of extremely heavy occurrence there. Type I, which appears to be fairly closely related to Type H, is quite heavily represented at Chichen Itza.

The Copan treatment is the most distinctive. Type E designs, while partially paralleled at several sites, occur in "pure" form only at Copan. The nearby sites of Quirigua and Paraiso display variant treatments, while others occur at Xultun, La Amelia, Seibal, and perhaps Chichen Itza.

Other somewhat less notable trends exist according to site or region. Quirigua stands somewhat apart in its relative emphasis of the wavy-topped Type F flowers. The Usumacinta sites tend, in general, toward Group II representations, but in this they follow the emphasis of the Maya area as a whole. Copan and Palenque have a virtual monopoly of the mammiform Type M designs, except for certain untabulated forms in the Dresden Codex. The generally realistic Type A flowers are of sporadic occurrence in the Maya area outside northern Yucatan; the most noteworthy clusterings appear to be at Palenque and Bonampak. A variant of Chichen Itza's flaring, highly distinctive Type C flower occurs at Palenque (fig. 1*c*); more strikingly, the form is duplicated in a single design at Chinkultic (Entry 43). The widely opened Type J flowers at Chichen Itza and Chama also display surprising resemblances, considering the virtual absence of the form elsewhere (cf. such Chichen Itza representations as Entry 40 with Entry 204 and Gordon and Mason, 1925–43, vol. 1, pl. 2). Group III flowers are almost exclusively confined to the northern Yucatan sites, the codices, and Alta Verapaz pottery, being virtually nonexistent in the Classic Maya sites of the Central Region. Chichen Itza also shares with Tulum, Santa Rita, or the Madrid Codex such types of low occurrence or limited distribution as P, Q, and R.

Unusual similarities in the depiction of a group of flowers from separated regions are of considerable interest. Portrayals from the northern Yucatan site of Xcalumkin compare, on the one hand, with Yaxchilan (Entries 134a, 147) and on the other with a vase from Nebaj in the Alta Verapaz (Entries 134b, 213). A variant Type A design, which may, however, represent featherwork, compares suggestively with this group (Entries 81d, 134b, 213).

For most of the sites, however, representations are too few to permit much in the way of meaningful generalizations. Only those centers well known for their stone carvings or murals offer much in the way of comparative material.

Petaled and sepaled Group I flowers occur rarely if ever prior to late Classic Period times. At Copan, for example, the highly standardized Type E form appears only in 9.16.10.0.0, well along in a sequence of floral or leaf forms which dates back some ten katuns. Thereafter, this type dominates flower representations at the site. Type A flowers at Palenque and Piedras Negras may be the earliest of the Group I designs. It is of interest, accordingly, that a variant Type E representation, lacking the thickened sepal but sharing its asymmetry, its over-all contours, and its row of dots along the outer edge of the petals, apparently occurs quite early on Stela 19, Xultun (Entry 136). Morley tentatively assigns the monument on stylistic grounds to the first quarter of Baktun 9 (Morley, 1937-38, vol. 1, p. 392).

Type M and N designs, unsepaled and unpetaled, seem generally to have a chronological precedence. Leaflike Type N representations occur on an Esperanza Period vase from Kaminaljuyu (Entry 211, fig. 4*g*), on Stela 1, Tikal, dated by Morley from "very early in Baktun 9, perhaps as early as 9.1.0.0.0" (Morley, 1937–38, vol. 1, p. 297; Entry 124, fig. 3*i*), and on the Ball Court Marker at Chinkultic, which bears a possibly contemporaneous 9.7.17.12.14 Initial Series inscription (Entry 43). It also precedes the Type E flowers at Copan, occurring there perhaps in both Katuns 11 and 12 (Entries 48, 49). The mammiform Type M designs seemingly occur somewhat earlier than the N forms at Copan, in 9.6.10.0.0 and 9.10.15.0.0 (Entries 44, 45). The type reappears at Palenque on the piers of House A, which bears an Initial Series date of 9.8.16.15.13 but that is more probably to be placed in Katun 14 (Entry 70, fig. 6*f*; Proskouriakoff, 1950, p. 192). Perhaps there was a tendency in later times for the sepaled Type H form to replace the unsepaled Type M.

Broad chronological trends in the development of floral art in the Maya sculptures and murals may be postulated on the basis of the tabulated data. Type M and N flowers of Group IV category would appear to be of initial occurrence. Lacking sepals as well as petals, they may actually represent leaves. Sepaled Group II flowers, especially H and I, eventually replaced them in popularity. Shortly thereafter, Group I petaled and sepaled flowers, which include the most surely identified water lilies, appeared and gained in favor. Their vogue lasted into the Mexican Period, as witnessed by numerous examples in the Ball Court complex but not in the sculpture of supposedly later buildings at Chichen Itza (Tozzer, 1930; cf. Proskouriakoff, 1950, p. 171). The Dresden Codex, however, retained Type H forms, many of which do not appear in the tables. Not in profile and of limited occurrence, Group V types would seem to come in during late Classic times and continue into subsequent Yucatecan art. Finally, in Mexican Period times or later, Group III flowers (petals and sepals undifferentiated), as well as such divergent Group II types as O and P, have almost their only known occurrences.

FLOWER ELEMENTS

Certain detailed elements marking the flower remain to be considered. Some of these elements, in conjunction with the over-all shape of the flower, comprise the criteria upon which the flower types just discussed are based. Others are nondiagnostic. The elements relate primarily to markings within the flower but in some cases concern its shape or appendages. They are described in terms of the structure of the flower, for in many cases it seems certain that they are standardized conventionalizations of flower parts.

Elements of the Maya Treatment of the Water-lily Flower

Element *a*. Petals are indicated by lines which occasionally have the semidistinct quality of bands, causing slight to marked serrations at the flower's top (figs. 3*e*, 6*e*). Usually, however, they merely rise to an essentially unbroken surface (figs. 1*b*–*d*). Lines may pass fully to the base of the flower or may terminate sooner. In the latter case, something akin to the "zoning" of Elements *k* through *o* results.

Element *b*. Two enclosing sepals are indicated by bands which flank the corolla or inner portion of the flower (figs. 2*d*, 5*g*, *h*). Considerable variation exists in the relative length and straightness of the sepals and in the angle at which they pass outward from the base (figs. 1*d*, 6*d*).

Element *c*. The general remarks made about Element *b* apply, but a third sepal passes up the center of the flower (figs. 1*b*, 3*g*, 5*a*).

Element *d*. Bands or lines pass to the flower's surface, but it is not clear whether petals or sepals are intended (figs. 2*c*, *e*, 3*b*).

Element *e*. The sepal is heavily thickened (fig. 6*b*).

Element *f*. The stem enters the flower proper (figs. 3*h*, 4*c*, *d*).

Element *g*. At the flower's base, the top of a sepal band whose lower edge is flat juts upward into the flower proper (figs. 2*a*, 3*d*, 5*d*). In appearance, the design seems transitional on the one hand to *b* and *c* type sepal bands and on the other to Elements *h* and *i*.

Element *h*. A band or line passes along the central axis of the flower, but, differentiated at its base from the flanking Element *b* sepals and the stem, it is probably neither a third sepal nor an entering stem. A tentative identification as the ovary (the enlarged basal portion of the pistil) is suggested (figs. 2*a*, 3*e*). Variant forms, which may be sepals, occur (figs. 1*c*, 5*e*, 6*e*).

Element *i*. A row of dots or circles, or a single centrally placed dot, passes similarly along the central axis of the flower (figs. 3*h*, 4*d*, 5*h*). In position it corresponds to Element *h* and, like it, may have some connection with the pistil.

Element *j*. Marginal dots or circles appear at the outer tips of the petals. Ideally, the row of dots is unbroken and close-set (figs. 5*a*, *e*, 6*b*).

Element *k*. A row of dots sets off a zone toward the base of the flower (figs. 1*b*, *c*, 3*e*). Stamens or carpels may be indicated.

Element *l*. Essentially vertical lines set off a zone toward the base of the flower and, as previously suggested, may indicate the stamens (fig. 6*h*).

Element *m*. Crosshachure sets off a zone toward the base of the flower (figs. 3*d*, *e*, 6*e*). This zoning may have conventional significance of the sort suggested for the preceding elements. The interpretation is especially favored by a probable water lily, depicted on a gold plaque from the Sacred Cenote at Chichen Itza, which displays crosshachure in the interior area where stamens would occur (Willard, 1926, p. 129).

Element *n*. Semicircular lines or differences in coloring set off an area toward the base (figs. 1*b*, *c*).

Element *o*. Straight, horizontal lines crosscut the flower, occurring mostly although not exclusively toward the base. This element occurs principally with Flower Type K.

Element *p*. An enclosed inner area is marked off, sometimes paralleling the shape of the flower and sometimes differing from it (figs. 2*a*, 3*b*, 4*c*). Upper as well as lower portions of the flower are subject to this marking.

Element *q*. The flower takes on a mammiform shape, this usually being the form of the top but also known to be the shape of inner Element *p* (figs. 4*e*, 2*a*). The mammiform quality may be subtly suggested by the contour of the individual petals (fig. 6*h*), developed (fig. 4*c*) or exaggerated (fig. 5*g*).

Element *r*. The stem swells slightly, then depresses, just prior to its juncture with the flower. The more realistic treatments of this phenomenon, which occurs on water lilies, are not tabulated, but exaggerated instances of it, which presumably go back to this prototype in nature, are regarded as the element (fig. 2*b*; cf. Maudslay, 1889–1902, vol. 4, pl. 26, No. 4; Palacios, 1937a, fig. 4*l*).

Element *s*. Small scrolls or a roughened, knobby treatment occur at the place of juncture between stem and flower (fig. 1*c*).

Element *t*. Scrolled, sepallike elements occur at or near the base of the flower. The symmetrical placing of two highly curved elements below the main sepals is regarded as the "pure" form of this element (fig. 1*d*, 3*e*, 6*h*).

Element *u*. A somewhat similar effect is gained by the loose, dangling end of a knotted stem (fig. 6*b*). Although perhaps fortuitous, the resemblance to Element *t* is striking.

Element *v*. Plumes pass outward from the flower, thus assuming somewhat the position of the fish in the fish and water-plant motif (fig. 1*d*).

An additional artistic feature of some importance is not, unfortunately, made the special subject of tabulation. It consists of a long, frequently curving element which extends beyond the central part of the corolla. Sepallike, it often results in a questioned tabulation of either two or three sepals. Often an exaggeration of the mammiform Element *q* is suggested. Yet, notwithstanding considerable variation in treatment, the element has a quality of its own (figs. 2*f*, 3*d*, 4*d*, 5*e*).

As revealed in table 4, an unusually large number of flower elements occur at Chichen Itza, Palenque, Copan, and Quirigua. Of the 22 elements, only 2 or 3 are absent from Chichen Itza. One of these, Element *i* (a row of dots along the center of the flower), is a rather striking omission, in view of its widespread occurrence in the Maya area as a whole. Chichen Itza emphasizes two- rather than three-sepaled flowers (Element *b*) and, correlating with its large number of Group III flower types, has a heavy occurrence of undifferentiated petals and sepals (Element *d*). More than 50 percent of the tabulated flowers having petals occur at this one site (Element *a*). Sepal scrolls (Element *t*) are largely confined to Chichen Itza. The mammiform Element *q* is of unusually high occurrence at Palenque. The thickened sepal (Element *e*) and the loose end of a knotted stem (Element *u*) are characteristic of Copan. No single element stands out at Quirigua. Instead the site seems cosmopolitan, sampling widely and not greatly emphasizing any particular approach.

Some traits are shared to a seemingly significant degree by only two or three sites. The various elements of basal zoning (*k* through *o*) are unusually developed at Chichen Itza, Palenque, and in the Alta Verapaz. Elements *k* and *n* (basal dots, curved basal lines) provide special correspondences between Chichen Itza and Palenque (figs. 3*e*, 6*h*, 1*b*, *c*). While of low occurrence, the knobby area of juncture between stem and flower (Element *s*) is perhaps confined exclusively to Palenque and Chichen Itza. Dots placed at the tips of the petals (Element *j*) occur in any frequency only at Chichen Itza and Copan. Sepals notably in the tradition of Chichen Itza appear at Xcocha, Chama, Quirigua, and Yaxchilan (Entry 134c, figs. 5*e*, 2*a*, *f*). The only occurrences on the monuments of Element *v* (feathers placed against the flower) may be at Chichen Itza and northern Yucatan, but the form if not the concept is duplicated at Quirigua and perhaps Palenque. Moreover, unless balls of featherwork have been misclassified as flowers, the same association takes place on pottery from Yucatan and the Middle Motagua, and it may be present in the codices.

The data of the tables show a general tendency for Flower Elements *f*, *p*, *q*, and *h* to have a chronological priority over the others. These traits (stem entering flower, inner area, mammiform shape, and line along center of flower) are often associated with Flower

Groups II and IV. Making their appearance considerably later in Classic times if not, in some cases, subsequent to it, are Flower Elements *l*, *m*, *o*, and *v* (various types of basal zoning and feathers pendent from the flower). Perhaps to this late category should be added Elements *g*, *j*, and *u* (jutting of sepal into flower's base, circles at flower's top, and sepallike appearance of a knotted stem). Regardless of the time of first appearance in the floral art of the sculptures, however, the traits agree in their pattern of continuation until the latest known times.

STEM AND ROOT

Wide variation exists in the representations of the plant stems. The treatment may be quite simple when the flower occurs as a headdress ornament, the mere suggestion of a knot perhaps being shown. Frequently, however, the knotting is made the subject of great elaboration. This is particularly true at Copan (fig. 6*b*) and in Copanlike treatments at Quirigua (Entries 105, 113). Knotting of flower stems around the wrists of a crocodilelike being also occurs at Copan, in connection with fish (Entry 58). Flower stems are bound around the arms and wrists of figures in the Santa Rita frescoes, taking on a ropelike quality (Entry 120). Flower stems are wound around the waist in the Tulum frescoes (Entry 133). The knotting of stalks into scrolled or angular panel forms may be another manifestation of the same tradition (fig. 4*d*).

Six Panel Types are recognized for the shapes assumed by the stem (table 1). The forms are basically geometric and, notwithstanding considerable superficial modification, are rather highly standardized.

TYPES OF MAYA TREATMENT OF THE STEM AS A PANEL

A. The stem rises and falls in angular undulations (fig. 1*c*, *d*).

B. The stem is a basically horizontal band which passes downward at either end. In certain instances (Entries 71, 118, fig. 3*f*) the band is halved, the disconnected portions balancing one another to achieve the effect.

C. The stem is a basically horizontal band which, however, takes the form of an inverted, much-flattened T. It descends from its source and divides, passing horizontally on either side and then jutting slightly upward (fig. 2*f*).

D. A U-shape is taken by the stem.

E. The stem passes back on itself to form an enclosure. Knotting of the sort just discussed may occur. The height tends to exceed the width and the contours tend to be angular, but a circular wreathlike form is also known (fig. 4*d*).

F. Highly scrolled and cursive aspects basically modify the angular qualities of the panel type.

Panel Type A is perhaps exclusively confined to Chichen Itza and Palenque. It appears in great strength at the former site, its occurrences at the latter usually being subject to cursive modification. One of the Palenque Type A panels is highly angular, however (fig. 1*c*). Occurring along the walls of buildings at Chichen Itza, where space limitations are not so great as on the stucco piers at Palenque, the panels tend to be much longer. Dating at Palenque is in doubt, but Proskouriakoff (1950, pp. 137–192) regards the piers of House D, in which the two typical examples occur, to be the latest in the Palace complex, from about Katun 16 of Baktun 9. The Sayil example compares in part.

Panel Type B occurs more widely, being known from Copan, Palenque, Quirigua, and perhaps Cancuen and Tulum, and on Alta Verapaz ceramics. Its earliest dated appearance is probably in Katun 10.

Panel Type C occurs prominently at Piedras Negras, where it dates from Katuns 12 to 16, and appears also at Yaxchilan and Chichen Itza (fig. 2*f*, *d*). Many striking parallels exist in the latter representations. The type is suggested at Tulum.

Panel Type D occurs at Copan and Quirigua (Katuns 15, 16).

Panel Type E occurs prominently on two Quirigua stelae (Katun 17) and in the Dresden, Madrid, and Perez Codices.

A tuberous root, probably the water lily rhizome, is occasionally depicted. It occurs with striking realism on a vase from Yucatan (fig. 6*e*). Similar designs occur at Palenque (fig. 1*c* and, perhaps, 1*b*). Stylized, the rounded objects at the ends of long stems at Sayil (Entry 121b) compare with the rhizomes of figure 6*e*, both in marking and in position. Analogous forms, which recapture much of the same swollen, knobby appearance, are discussed below in connection with the Overall Type IIe. They are found at Palenque, Chichen Itza, the Alta Verapaz, and, in highly variant form, Copan.

Uncertainties in the chronological record, coupled with the lack of sufficient data about representations on media other than the monuments, prohibit more than speculation about the development of floral forms. In analyzing the water lily forms, however, one is constantly forced to revert to the decorations in the Palace at Palenque. Here occur what seem to be the most realistic portrayals, the most convincing prototypes to nature, the most characteristic conventionalizations (figs. 1*b*, *c*, 3*g*). Stela 8 at Piedras Negras, which displays rather close similarities in flower and leaves, is relatively early (9.14.15.0.0?). It is tempting to look toward the Usumacinta region for the major developments in the elaboration of the water lily.

MYTHIC ASSOCIATIONS OF PROBABLE WATER LILIES

GENERAL CONSIDERATIONS

As has been indicated, the water lily has frequently been associated with mythologic figures in highly distinctive ways in Maya art. These associations are given for individual representations in table 1 and are summarized in tables 5 and 6.

The mythic or symbolic associations are of different sorts: (1) The source of the water lily, i. e., the representations from which it seems to emerge; (2) the anatomical portion of a being from which the water lily emerges; and (3) the figures occurring amidst the plant. Additional features tabulated are the presence of flower-eating fish and of death symbols, the latter said by Lothrop to be a recurrent feature with water plants (Lothrop, 1926, p. 161; Thompson, 1950). The presence of the water lily in human and nonhuman headdresses is also noted, and the occurrence of these forms in glyphs is indicated. Presences of water lilies anywhere in the often very elaborate human headdresses are recorded. Only those water lilies which appear actually to be worn are recorded for nonhuman headdresses, the growth of plants from the head being classified under a separate category.

Mythic beings serving as the source of the plant are the heads of various long-nosed, serpentine, and perhaps bird forms, subsumed under the name of "Serpent Head X";[5] the Long-nosed God, complete with body; various forms with birdlike attributes, tabulated separately under the headings "Wing Panel," "Serpent Bird," and "Bird," but perhaps to be treated as manifestations of a single entity;[6] and the jaguar. Mask panels, which quite frequently may be representations of "Serpent Head X" or "Serpent Bird" forms, also occur as the source of the plant. Aside from the jaguar, which seems to stand somewhat aloof, the complex is a tightly knit one. Substitution of attributes appears to have been marked, both on an artistic and conceptual level.

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[5] The term "Serpent Head X" is taken from Kidder, Jennings, and Shook (1946, pp. 223-226). It has probably been extended somewhat in meaning from their original usage, but the interchange of artistic attributes among beings of possibly diverse origins has been so great that some all-inclusive term is required in the summary tables. "Serpent Head X" fits admirably, for most of the forms tabulated under this heading fall well within the range so designated by these authors. They have, moreover, called attention to the association of floral and leaf forms (Flower Types Q, N, in the present paper) with the mythic being in question.

[6] The term "Serpent Bird" is taken from Maudslay, who illustrated a number of examples of this being. According to him, its diagnostic feature was the profile conventionalization of a snake head, lacking a lower jaw, that is placed at the bony wing structure of a bird or used as an isolated element (Maudslay, 1889-1902, vol. 1, pl. 99, pp. 63-64). Spinden, however, questioned that this feature was of sufficient significance to warrant the equation of all forms showing it and employed the term "Wing Panel" in referring to it (Spinden, 1913, pp. 60-61, 78). As "Bird" is used in tabulations of the present paper, the body of a bird or even the somewhat conventionalized head of a creature possessing its characteristics is acceptable. But birdlike features on a Long-nosed God type of head result in tabulation under "Serpent Head X."

Largely in relation to these beings, the primary anatomical sources of the plant seem to be the top of the head and the ears, eyes, mouth, and hands; perhaps the nose and the neck should be included. So far as the jaguar is concerned, the only anatomical source is apparently the head (or possibly the ear, to which the stem eventually may lead back); this seems clear-cut. The case is much more complex for the other beings. It seems possible, however, that the emergence of the water lily from the head is primarily a feature of the Long-nosed Serpent Head X forms. Less certainly, the issuance of the plant from the mouth appears to be mainly associated with the Serpent Bird and its close affiliates. Ear, nose, and eyes as anatomical sources are shuttled back and forth among the various beings in a most complex way.

HANDS OR ARMS; FIGURES AMIDST PLANT

Hands or arms as sources from which the plant springs, or through which it passes, fit a different pattern. Human or anthropomorphic figures tend to occur with their bodies wholly or largely depicted, thus contrasting with the emphasis on detached heads or mask panels characteristic of the other anatomical sources. At Chichen Itza, in what must surely be representations of water lilies, numerous seated human figures are holding the undulating plants (fig. 1*d*). Two figures at Quirigua, one shown with jaguar paws, stand under a canopylike, Panel Type E arrangement of creepers or stems, the lower portions of which are held in their hands and arms (Entries 108, 109). Elsewhere at Quirigua and at Copan, the bodies of human figures that hold elaborated stalks are only partially depicted (Entries 115, 50, 51). This is also true at Palenque, where the Long-nosed God and so-called "Maize God" (Spinden, 1913, p. 89) are associated with elaborate stems or vines that pass from their hands (Entries 90, 81). Although the bodies of these Palenque and Copan figures are incompletely shown, the assumption of a reclining position analogous to that at Chichen Itza is indicated. The Long-nosed Deities, Gods B and K, occur in a somewhat similar situation in the Dresden Codex (Entry 305). A stalk or vine, held in the hands of God B, encloses the seated figure of God K in a Type E panel. The resemblance to the Quirigua figures just cited is suggestive (Entries 108, 109). Figures appear in panels, composed of interlaced vine or stalk forms, in the Madrid and Perez Codices (Entries 313, 317). They do not hold the stems, however.

A seated human figure from Palenque holds a water-lily leaf in its upraised hand (Entry 76, fig. 3*g*). A stem terminating in a realistically treated Type A flower hangs from the leaf. This appears to be one of the more securely identified water lilies in Maya art. A similar representation occurs in the Dresden Codex, held in the hand of the Long-nosed God (Entry 301, fig. 3*h*). Additional appendages suggest that some sort of paraphernalia is depicted, but the basic elements of water lily pad that is held in the hand and flower which hangs from the pad seems to be duplicated. A design on a Yucatan bowl shows a flower stemming from an unidentified object which is held in the hand (Entry 221, fig. 3*d*). The flower, Type B, is of interest because of its resemblances to some of the more surely identified water lilies at Chichen Itza. Its general contours and, in particular, the treatment of Flower Element *g* closely parallel the flower at the extreme right in figure 1*d*. Flowers, associated or unassociated with possible water lily leaves, seem to be attached to some sort of paraphernalia that is held in the hand in the Tulum frescoes and perhaps the Dresden Codex (Entries 131, 307).

A series of pictures in the Dresden Codex show God B holding or plucking stalklike objects. The stems arise from realistically depicted or conventionalized surface water (Entries 302, 303) and occur in association with fish (Entries 301, 304). Dancing, the god holds stems that are apparently rooted as creepers (Entry 304). These features suggest that the water lily, or at least some sort of waterplant, is depicted.

A Sayil panel shows a grotesque head in full face with arms stretching to either side (Entry 121b). The hands hold bulbous objects, which resemble the probable water lily rhizomes of figure 6*e*. One end of a pair of stems passes from these objects, while at the other end the stems issue from the eyes of the being.

HEAD OR FOREHEAD

The attachment of water lilies to the heads of Long-nosed God forms, or the actual growth of the plants from their heads, is apparent in a number of representations. Two highly specialized complexes, essentially identical to the Over-all Types IIc and IIe, emerge.

In a handful of representations, a distinctively shaped design, which may indicate the water lily rhizome, passes upward from the head of the Long-nosed God, branching once. It is known to occur only at Palenque, on Chama pottery, and in surprisingly similar form at Chichen Itza (Entries 73, 80, 201, 205, 29; figs. 5*h*, *i*, *g*). The design is somewhat tuberous in appearance and recalls the more realistically depicted rhizomes of Entries 77 and 22 (figs. 1*c*, 6*e*). In narrowing abruptly at the end, the vestigial stem which is thus formed (Over-all Type IIe) penetrates a flower of mammiform characteristics (Flower Elements *f*, *q*). The clear-cut features of the motif and the fact that, like other realistic representations of the rhizome, it is connected with the Long-nosed God type of head, make it of special interest. Somewhat similar designs, lacking identifiable water lily attributes, appear at Yaxchilan, Naranjo, and Bonampak (Maler, 1903, pl. 58; 1908 a, pl. 40, No. 1; Villagra Caleti, 1949, Room 3 of Structure 1).

In a series of Type IIc representations, the water-lily leaf is apparently tied to the forehead of mythic or human beings by a flower, presumably also a water lily. The most certain representation of a water-lily leaf at the forehead occurs in House C, Palenque (Entry 68). Here it is not tied on by a flower, but it provides a not-to-be-disputed precedent for the occurrence of water-lily leaves at the forehead. At Copan, where it forms the well-known fish and water-plant motif, the flower which attaches the water lily is Type E (Entry 53, fig. 6*b*). Here the leaf appears in front view, but the profile depictions form a somewhat more sharply defined and more numerous complex (e. g., figs. 4*a*, 5*e*, 6*c*, *d*). The rounded interior band (Element *h*) is especially pronounced, the outward marginal flare is emphasized, the shape is essentially square rather than rectangular, and the notched outline (Element *f*) tends to be characterized by sharp rather than squarish protuberances. Nevertheless, the differences seem to be ones of degree rather than kind. Vestigial marginal notches (Element *m*) in the Dresden Codex are akin to those at Palenque (Entries 310, 76). The flower at La Amelia shows resemblances to the asymmetrical Type E flowers at Copan (Entries 63, 53, figs. 6*d*, *b*). The flowers on a Chajcar vessel were recognized as water plants by Maudslay, and the stalks form an elaborate panel, of the general sort that characterizes some of the most surely identified of the water lilies in Maya art (Entry 208, fig. 5*e*).

The lower protuberances of profile water-lily leaves mentioned above are of particular interest, for they jut downward into the eye orbit in a way strongly reminiscent of the heavy bony brow ridges that appear with fair frequency on grotesque heads and fleshless skulls in Maya art. Altar R, Copan, illustrates this treatment nicely (Maudslay, 1889–1902, vol. 1, pl. 94*a*). A complex process of convergence, based on artistic interplay of motifs associated with the forehead, may be involved. In any event, the designs in question are set off sharply in other ways, and have close, crosscutting ties to the somewhat more definitely indentified water lily leaves and flowers.

In additional representations, foreheads which are marked by no water-lily leaves are nevertheless decorated by knotted flowers of possible water lily type. Full-face mask panels seem frequently to be treated in this way. The fish and water-plant motif occurs with these associations on exterior friezes of the Temple of the Cross, Palenque (Entry 84). In one of these representations, the stem is treated as a solid band. The forehead design on Altar U, Copan, is comparable, and the motif may occur here in more stylized form (Maudslay, 1889–1902, vol. 1, pl. 97*a*). Floral forms, which tend to be of the mammiform Flower Type H, occur with some frequency at the ends of head bands on mask panels in the Puuc Period architecture of Yucatan. The bands are sometimes composed of series of flowers in top view. The Monjas complexes, at both Chichen Itza and Uxmal, are rich in this sort of design (Seler, 1902–23, vol. 3, p. 713, fig. 2; vol. 4, p. 538, figs. 266–268; vol. 5, pp. 210, 224, 226, 236, 245, figs. 15, 35, 37, 38, 48, 63). These occurrences are not tabulated but are exemplified in figure 4*e*. Type J flowers are suggested in other representations which are worked into the mask panels and which occur on the same "stem" as a Group II floral type (Seler 1902–23, vol. 3, p. 713, fig. 2). The forms are often highly stylized and, while some relationship to floral designs is apparent, neither the possible role of convergence nor relationships with the water lily as such is clear. It is for this reason that they are omitted from the tables.

The occurrence of water-lily leaves without accompanying stems and flowers (Over-all Type IV) is much more limited. The presence of a probably unaccompanied leaf in House C, Palenque, on the forehead of one of nine stucco masks on the inner wall of the West Corridor, has been alluded to previously (Entry 68). A possible association of the water lily with one of the Nine Lords of the Underworld is suggested. (Cf. Thompson, 1950.) On Zoomorph P, Quirigua, elongated leaves apparently are placed at the foreheads of the mythic animal which comprises the boulder and of the mask carved upon its upper surface (Entry 118, fig. 3*f*).

EYES

A Mexican Period mask panel at Chichen Itza, which has interesting correspondences to several Classic Maya sites, is apparently marked at the forehead by a water lily leaf (Entry 22, fig. 2*d*). The squarish protuberances so characteristic of Leaf Element *f* overlie the eye orbits. Two stems apparently descend from the leaf, each cutting across an eye. The representation compares to the descent of the stem from a leaf in figure 3*g*, but at the same time it suggests the emergence of the stalks from the eyes. This motif occurs elsewhere at Chichen Itza (Entry 19), but is otherwise known only from a Sayil lintel (Entry 121b), Stela B, Copan, where it is repeated, and Stela 7, Yaxchilan (Entries 50, 152, fig. 2*b*, *f*). The latter monument is especially similar, for the stem likewise rises in a Type C panel in which animals appear. At Chichen Itza the animals are a water bird and turtle (Entry 22, fig. 2*d*), while in the Yaxchilan representation they are rodentlike. At Yaxchilan and Copan the eyes are feathered, although at the former site the being is a Long-nosed God form and at the latter, perhaps, a highly conventionalized bird. Stela 7, Yaxchilan, may date from Katuns 15 or 16 of Baktun 9, while Stela B, Copan, bears a 9.15.0.0.0 inscription.

The representation on Stela B, Copan, has interesting analogies in Classic Maya art. At Copan the stalk which hangs down from the eye has an inverted Long-nosed God head dangling from it; the stem then passes horizontally into the hand of a small human figure. The grotesque face from which the stem descends is in profile. Its nose or beak hangs down in a way resembling full-face representations of the Serpent Bird, and its feathered eye may be associated with that being (Maudslay, 1889–1902, vol. 1, pl. 99; Maler, 1903, pl. 70). It is identical, for practical purposes, to the profile mask at Palenque upon which the water-lily-holding figure is seated (Entry 76). This suggests that at Copan, too, the water lily may be depicted, although neither flowers nor leaves occur. On Stela D, Quirigua, a stem passes in a corresponding way from its source, in connection with a birdlike being, to the head of a Long-nosed God (Entry 104, fig. 2*a*). Here the stem seemingly emerges from the bird's mouth or, possibly, chest. A fish occurs at the bird's head or headdress which may, therefore, have water lily connections.

MOUTH

The emergence of water-lily-like plants from the mouth falls into two or three well-defined complexes. One finds stems passing from the corners of the mouth of a being shown in full face. The stems tend to pass outward in elaborate panels (Types A, B). The beings often show birdlike features; a Palenque example (Entry 72) is the Serpent Bird. The forehead of another, from Chichen Itza, is marked with crossed bands of the type seen to be present in a probable water lily leaf elsewhere at the site (Entries 24, 22). The latter representations are among the more certainly identified water lilies in Maya art. This complex appears at Chichen Itza, Palenque, and Piedras Negras (Entries 24, 72, 95, 99).

A second complex, relating to the emergence of a plant from the mouth, is known only from the site of Xultun (Entries 136–140). Flowers issue from the mouths of small cats, which are held in the hands of human figures. The composite Flower Type Q occurs, as does an asymmetrical form suggestive of Type E.

A third complex may, more remotely, refer to the emergence of flowers from the mouth. The missing lower jaw of the Wing Panel, a serpent head in profile, is replaced by numerous foreign elements such as feathers and nose plugs. Among the substituting elements are floral forms, placed partially behind the teeth, thereby giving the impression of emerging from the mouth. Conceivably the association is a conceptually fortuitous one, but it occurs in connection with the fish and water-plant motif at Palenque (Entries 70, 75, fig. 6*f*) and in highly interesting designs on Stelae A and C and Zoomorph P, Quirigua (Entries 108, 109, 115). At the latter site, flowers appear with the Wing Panel at the wing of the Serpent Bird (Entries 108, 109), and in at least one of these cases the outline of the Wing Panel is formed by a stem or vine (Entry 115). The stem is held in the hands of a human figure in each representation. In Entries 108 and 109, the stem may have its source at the head, beak, or ear of a much-eroded Serpent Bird, but, in any case, it terminates in the inverted heads of Long-nosed God forms. In this joining by means of stems or vines of Long-nosed God heads with the heads of probable birds, the pattern of Stela D, Quirigua, and Stela B, Copan, is repeated (Entries 104, 50).

In the Dresden Codex a probable stem, issuing from the mouth of an anthropomorphic vulture, is held in the bird's hand (Entry 308). This recalls the Sayil portrayal of the emergence of stalks from the eyes of a being who holds the same plant in its hands (Entry 121b). As is sometimes the case when the water lily surges from the mouth, the stems of the Sayil plant pass outward to both sides in an elaborate panel.

Not known to fit into a complex of this sort, a Flower Type N design emerges from the mouth of a serpent on Stela 1, Tikal (Entry 124, fig. 3*i*). The representation is noteworthy for its unusually early occurrence, probably at the very beginning of Baktun 9.

MISCELLANEOUS ASSOCIATIONS

A stem is frequently associated with the jaguar's head. Frontward growing, its source is hidden in the region at the back of the head or ears. Appearing on a jaguarlike being in the Temple of the Sun, Palenque, the stems, two in number, seem to spring forth from the region just back of the ears (Maudslay, 1889–1902, vol. 4, pl. 88). The stems occasionally terminate in flowers, the shape of the stem being unchanged. The mammiform Type M flower occurs in this connection (Entry 44, fig. 4*c*) The similarly placed flower on a vase from Chama (Entry 203, fig 5*f*) is virtually identical to a flower which ties a probable water lily leaf to a serpentine head on a Chajcar bowl (Entry 208, fig. 5*e*). A jaguar depicted on a Yucatan bowl sits in a wreath of probable water lilies, and a flower may grow from its head or ear (Entries 219, 220, fig. 4*d*). Such features tend to associate the jaguar with the water lily. Spinden has pointed out the water-lily-like appearance of a flower in the Dresden Codex that grows from the jaguar's head (Entry 309), and on the strength of this has postulated a further association of the jaguar with the fish and water-plant motif (Spinden, 1913, p. 77).

A close correspondence has been pointed out previously between bowls from the Rio Hondo, British Honduras, and the Esperanza Period of Kaminaljuyu (Kidder, Jennings, and Shook, 1946, pl.226). Although the fish and water-plant motif occurs only on the former vase, and its Type Q flowers are replaced by Type N "leaves" on the Kaminaljuyu vessel, the mythic beings with which the vegetation is associated are strikingly similar (Entries 211, 214, figs. 4*g*, *f*). In each case, six projecting elements, feathers with crosshatched circles, rise from the Long-nosed God or Serpent X heads. The feathers are of the type that sometimes occurs in connection with the Serpent Bird and the Wing Panel (Maudslay, 1889–1902, vol. 1, pl. 99*d*, *e*, *h*). Their occurrence at the top of the head recalls the mask panel on Stela 4, Yaxchilan (Maler, 1903, pl. 70), a representation which in turn shows strong correspondences to the Serpent Bird (Tozzer and Allen, 1910, pp. 337ff, pl. 21). A complex which is conceptually linked to flowers and, by extension, to the water lily, seems once again to embody aspects of the bird and Long-nosed God or serpentine forms.

Several representations of the Serpent Bird with Wing Panel markings show it wearing a distinctive type of bar pendant around its neck (Taylor, 1941, p. 52, fig. 8*g*). Designs from Palenque, Chama, Xcalumkin, and in the Perez Codex are especially to be compared (Maudslay, 1889–1902, vol. 4, pl. 81; Proskouriakoff, 1950, fig. 95*c;* Dieseldorff, 1926–33, vol. 2, p. 29, pl. 32*b;* Perez 12*b*). The pendant recurs at the necks of probable vultures in a panel of water lilies at Chichen Itza (Entry 26, fig. 1*d;* Tozzer and Allen, 1910, p. 332, pl. 19, fig. 14). It appears again at the neck of a similar bird, pictured on a Río Hondo vase, resting on a possible water-lily plant (Entry 215). Serpent-Bird-like beings occur in full-figure glyphs on Stela D and Zoomorph B, Quirigua, sometimes with the bar pendant and sometimes with vulture aspects (Maudslay, 1889–1902, vol. 2, pls. 14, 15, 25, 26; Spinden, 1913, pp. 80–81).

Flowerlike forms, which may well be water lilies, occasionally appear at the corners of shields or shieldlike medallions. Such flowers are tabulated, but the frequent placement of probable balls of featherwork at the corners of shields proves a source of confusion (cf. Maler, 1901, pl. 17; 1903, pl. 74, No. 2). Flowers or feathers at the four corners of the jaguar-head shield in the Temple of the Sun, Palenque, form perfect Palenque-type water lilies except for absence of sepals (Entry 81d). Medallions at Palenque, Quirigua, and El Chicozapote may possibly be compared (Entries 81c, 103c, 116, 59a). Floral forms also appear at the corners of "eclipse shields" on pages 56 and perhaps 52 of the Dresden Codex.

Stylized flowers occasionally appear on loincloth aprons as the central element in Proskouriakoff's leaf-and-fringe motif (Proskouriakoff, 1950, pp. 38, 97; Entries 59b, 67a, 103a, 122a). It is of interest, therefore, that more realistically treated flowers hang from stems in a corresponding position (Entries 217d, 312b).

A possible association of significance exists between the water lily and the ball game. Water lily designs occur prominently on the benches of the Great Ball Court at Chichen Itza, a single motif, of flowering stalks growing from the decapitated neck of a ball-game player, being repeated six times (Entry 35). Water lilies are prominently depicted elesewhere in the Ball Court complex—in the South Temple, the Temple of the Tigers, and the Lower Chamber of the Tigers. Floral forms are, however, of heavy occurrence elsewhere in the representative art of Chichen Itza. Although ball-court markers at Chinkultic and Copan also display floral representations, many others are lacking in them. While these occurrences are of considerable interest, it seems best, in view of the inconclusive data, not to press the matter too far.

GLYPHIC ASSOCIATIONS OF PROBABLE WATER LILIES

Several of the representations referred to in the preceding section are hieroglyphs. It is apparent, therefore, that nonglyphic portrayals which share a given complex with glyphs bear upon the problem of the glyphs and are, in turn, to be understood in terms of them.

The occurrence of Long-nosed God heads connected by stems to bird forms is of particular interest in this regard (Entries 50, 104, 108, 109). Stela D, Quirigua, is one ot the rare monuments having full-figure inscriptions (fig. 2*a*). Here the long-nosed being is the head-variant of the number 13, and the grotesque bird, with a fleshless lower jawbone, is the full-figure variant of the tun sign (Morley, 1915, fig. 52*b*′). The inverted long-nosed heads on Stelae A and C, Quirigua, which dangle from possible water lily stems, have the down-curved, beaklike noses of the bird forms in the hieroglyphs (Entries 108, 109). Their heads are marked with tau signs, which appear prominently in connection with a probable water lily panel at Palenque (Entry 71), and are feathered (cf. Entries 211, 214). On Stela B, Copan, the dangling Long-nosed God heads may also have a connection with time periods of the sort dealt with on Stela D at Quirigua (Entry 50, fig. 2*b*).

The head variant of the number 13 recurs, in connection with the water lily, at Palenque (Morley, 1915, fig. 52*x*,*y*; Entry 69, fig. 4*a*). The leaf is tied to the Long-nosed God's forehead by a sash, and floral forms rise from the leaf or head.

Flowers, apparent variants of the Type E water lilies at Copan, are tied to the heads of several beings in the full-figure glyphs of Stela D and Zoomorph B, Quirigua. Toads, as the uinal variants, wear such headdresses on Stela D (Entry 105) and Zoomorph B (Entry 112). In other glyphs, of unknown significance, beings wear similar flowers (Zoomorph B, Entries 113, 114). A possible flower is placed at the forehead of a head variant of the number zero (Stela D, Entry 106).

A flower-bearing stem issuing from its head or ear, the jaguar occurs at Copan in glyphs of unknown meaning (Entries 44, 49, fig. 4*c*). Jaguar glyphs at Yaxchilan may depict flowers in top view, near although not connected to the head; featherwork may, instead, be intended (Maudslay, 1889–1902, vol. 2, pls. 88, Nos. 6, 7; 89, Glyph M2). More closely corresponding to the jaguar of figure 4*c* is the same animal in the variable element in the Introducing Gylph, as patron of the month Pop. Beyer, while regarding the tusk as the most characteristic detail of the jaguar as a month indicator, notes the presence of "flourishes" adorning its head (Beyer, 1931, p. 100). These flourishes are, in some instances without any doubt, the same stem form that occurs in nonglyphic art.

The variable element in the Introducing Glyph for the month Pax may be "a symbol of vegetation," which replaces the lower jaw of a solar deity (Beyer, 1931, pp. 106, 108). On Zoomorph B, Quirigua, it occurs in this way, given the appearance of emerging from the mouth (Entry 111, fig. 6*a*). A similar design occurs in Glyph 11, passing from the mouth of the probable head variant for number 8. This glyph records the date 8 Pax, and it would appear that reduplication occurred, the characteristics of the month Pax being given to the full-figure variant of the accompanying numeral (cf. Morley, 1937–38, vol. 4, pp. 167–168).

A double row of Type H flowers occurs in association with a kan (yellow) sign, comprising a glyph in the Temple of the Foliated Cross, Palenque (Entry 91, fig. 4*b*).

The occurrence in glyphs of vegetation forms, which have the associations that characterize probable water lilies in Maya art, appears to be especially strong at Copan, Quirigua, and Palenque. The present compilation of floral motifs in the glyphs lays no claim to completeness, however. Furthermore, much of the emphasis on flowers in glyphs at Quirigua results from repeated occurrences of the motif on two monuments bearing full-figure inscriptions, Stela D and Zoomorph B. Other examples of the rare full-figure glyphs are not so dominated by floral motifs.[7] Perhaps, for some fortuitous reason, it became the vogue to depict the water lily extensively on these

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[7] The fish and water-plant motif does occur in the sculptured scene accompanying the full-figure glyphs at Palenque (Entry 81e).

Quirigua monuments, and in applying this favored motif regard was not given to the inherent symbolism most appropriate to the specific time units, numbers, or deities involved. That this explanation cannot hold for *all* the glyphic floral representations on these monuments, particularly on Stela D, is indicated by certain important correspondences to motifs elsewhere in Maya art. Nor is a brief held for this explanation of the other floral occurrences.

Thompson, in his recent work on Maya hieroglyphic writing, has independently noted the association of certain deities with water lily flowers. Designated by him are the old god of the number 5 (Thompson, 1950, p. 133; Entry 12 in the present paper); the rain and storm god of number 6 (Thompson, 1950, p. 134; Entry 78); the death god as lord of number 10 (Thompson, 1950, p. 279; cf. Entry 55); the Long-nosed God of number 13 (Thompson, 1950, p. 136; Entries 69, 104); the jaguarlike patron of the month Pax (Thompson, 1950, p. 115; Entry 111); and the crocodilelike Imix earth monster (Thompson, 1950, p. 72; perhaps various of the "Long-nosed" or "Serpent X" heads in the entries, e. g., Entry 78). The suggestion is also made that the comb form of the "count" affix, which is usually designated as a fish fin, may possibly be the stylization of a water lily flower (Thompson, 1950, pp. 44–45). Such an interpretation is consistent artistically with many representations of the water lily and, in fact, had occurred to the present writer. Representations such as those in Entries 134a, 147 should especially be compared.

Thompson further regards the normal or symbolic form of the day sign Imix as derived from a water-lily flower (1950, p. 72, fig. 6). Characteristic of Imix, in fact, are markings corresponding to Flower Elements *a* or *d*, *k*, *m*, and *n* ("petal" lines, dots toward base of flower, crosshachure toward base, semicircular line or color difference toward base). Of these elements, *k* (a semicircular row of dots toward the flower's base) is especially characteristic of Palenque and Chichen Itza, being unknown in the ideal form in which it occurs in the hieroglyphs in floral representations from other sites. Combined with Elements *m* or *n* (crosshachured or uncrosshatched basal semicircle), Element *k* forms a configuration known in floral forms only from Palenque and Chichen Itza (although cf. Entry 222). Yet if Imix is derived from the water lily, it is surprising that the same type of treatment is not more characteristic of representations of this flower in the Maya area as a whole. If, as seems probable, many of the floral forms lacking these features are correctly identified as water lilies, it would appear either that Thompson's derivation is incorrect or that for some reason Palenque and Chichen Itza alone maintained these important features of the tradition of depicting the water lily which was in vogue when the appearance of the day signs, or at least of the day sign Imix, was worked out. Could the portrayal of the water lily flower at these two sites have undergone, perhaps independently, an anachronism which based the depiction of the flower on the glyph Imix and thereby enabled the artists to duplicate the flower as it was represented in much earlier times? Or could some other media, such as the codices, have continued to portray the water lily in the old Imix manner concurrently with the varied changes taking place in the floral art of the sculptures during Classic times? If the Dresden Codex, with its wealth of Group II flowers, can be regarded as representative of the codices, this last explanation would appear to rest on very shaky foundations.

AREAL AND CHRONOLOGICAL TRENDS

OVER-ALL TYPE

Site-by-site occurrences of the various symbolic associations are presented in table 5, together with totals of the Over-all Types. Numerals refer to the total number of representations. The types designate the combinations of flower, leaf, stem, and root that occur in each representation. The most distinctive of these types have been previously discussed (IIc, e); the others require little explanation:

TYPES OF MAYA TREATMENT OF THE COMBINED FLOWER, STEM, LEAF, AND ROOT

Type Ia. The flower only is depicted. Because of the absence of other features, this type is most apt to be confused with balls of featherwork.
Type Ib. A flower occurs on a relatively simple stem. If the stem is very short but nevertheless observable, a questioned occurrence is tabulated.
Type IIa. A flower occurs in connection with a complex stem.
Type IIb. A flower occurs on the same stem as a leaf or leaves.
Type IIc. A leaf is attached to the forehead by means of a knotted flower.
Type IId. A flower occurs in connection with a distinctively marked rhizome and stem.
Type IIe. A flower occurs at the tip of a vestigial stem, which is little differentiated from the tuberous rhizome.
Type IIf. Flower, leaf, rhizome, and stem occur together.
Type II–?. A complex stem occurs, but its associations are not clear.
Type IIIa. A simple stem appears, unaccompanied by other parts of the plant. It is particularly associated with the jaguar's head.
Type IIIb. A complex stem occurs, unaccompanied by other parts of the plant.
Type IV. The leaf only occurs.

Type Ib, a flower attached to a relatively simple stem, is of greatest occurrence in Maya art. Probable flowers which lack stems are of next strongest occurrence (Type Ia), followed by flowers attached to complex stems (Type IIa). Of notably weak occurrence are the combinations of flower, rhizome, and stem (IId, e), flower, leaf, rhizome, and stem (IIf), and isolated leaves (IV). Palenque, whose wide variation in this respect compares to the near universality of flower types and elements at Chichen Itza, has the only known designs that bring together flower, stem, leaf, and rhizome in a single representation (fig. 1*b*, *c*). It may share the occurrence of a leaf, without other associations, with Quirigua only. Chichen Itza stands out in the emphasis given the complex stem (Types IIa, II–?).

Table 6 gives the occurrences of Over-all Types and symbolic associations in time. For the monuments, the break-down, when possible, is according to the 20-year katun periods. Table 6 differs from the others in that its numerical entries refer not to the total number of representations but to the total number of monuments (e. g., stelae or structures, on which the representations occur. Utilized in conjunction with the other tables, table 6 gives a better perspective of the total activity put into floral representation.[8]

The earliest of the Over-all Types, as revealed in table 6, is the flower attached to a simple stem (Type Ib). The type is of steady occurrence without significant chronological change. The earliest recorded occurrence of the complex stem is a variant Type IIe representation on Stela 2, Copan (9.10.15.0.0?) (Entry 45). This distinctive type, while of limited distribution, seems to possess a fairly long time range. Type IIc (a leaf tied to the forehead by a flower), of possible ocurrence in earlier times at Palenque, is first definitely recorded in 9.15.0.0.0. The complex stem, unaccompanied by other forms of vegetation, seems first to appear in Katun 12 (Type IIIb). The vestigial stem at the head of a jaguar or similar being extends back from the time of the latest classic stelae, erected in 10.3.0.0.0, to 9.4.0.0.0 (Type IIIa).

MYTHIC ASSOCIATIONS

Certain sites stand out significantly in the occurrence of one or two symbolic associations. The flower-eating fish and presence of plants in the human headdress are of marked occurrence at Bonampak. Most of the associations are present at Chichen Itza, but of especial strength at the site is the presence of human figures amidst the plant. As many of the associations appear at Copan as at Chichen Itza. Human and nonhuman headdresses at Copan are frequently connected with the floral forms, and the flower-eating fish is of important occurrence. A greater number of associations are present at Palenque than at either Copan or Chichen Itza. Flowers appear especially in human headdresses, and the growth of plants from the heads of mythic beings is marked. The greatest number of associations of any Maya site occurs at Quirigua. No one trait stands out; the cosmopolitan quality observed in connection with the Flower Elements (table 4) is repeated. Xultun emphasizes the jaguar. Perhaps the most striking emphasis of a particular trait is found at Yaxchilan, where the Wing Panel appears with great frequency, in contrast to its virtual lack of association with the flower elsewhere. Partly for this reason, the human headdress, in which the Wing Panel occurs, is of correspondingly high association with the flower. The human headdress and growth of the flower from the head tend to be emphasized in the Alta Verapaz ceramics. The Dresden Codex emphasizes the Long-nosed God's hand in connection with flowers.

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[8] "Monument" as used in the tables has a special meaning. A stela equals a monument. But *all* the sculptured or painted portions of a single building—lintels, wall panels, walls, columns, and so on—total only a single monument. The purpose of this terminology is to arrive as nearly as possible at the *generalized unit* dealt with by the artist in depicting the water lily, regardless of the size or complexity of the plant or plants involved. If this were not done, a building rich in depictions of the plant would receive undue weighting in comparative studies. "Representation" also has a special meaning in the tables. It may roughly be said to be the equivalent of a plant stalk, i. e., of a distinct plant. But if distinct though closely corresponding stalks emerge from the two corners of a mouth, only a single occurrence is tabulated. To exemplify further, if two identical stalks are in a single headdress, only one occurrence is noted, but if they are distinctly treated two representations are tabulated. The purpose of this manipulation is to arrive as nearly as possible at the *specific unit* involved, regardless of the complexity of that unit.

Traits of scant distribution serve occasionally to couple certain sites together. Stems emerge from the eyes at Chichen Itza, Sayil, Yaxchilan, and Copan. Animals amidst the plant, not tabulated separately, appear at Chichen Itza and Yaxchilan. Heads are connected by stems at Copan and Quirigua. The nose as the source of growth or attachment of vegetation occurs at Tulum and Santa Rosa Xtampak and, under quite different circumstances, at Piedras Negras, and perhaps other sites. On the monuments, human figures occur amidst the plant only at Chichen Itza, Copan, Palenque, and Quirigua. Full-figure portrayals of Long-nosed God forms in connection with flowers are known in the sculptures only at Palenque and Quirigua.

The associations of the plant forms, some of a highly arbitrary nature, are given according to period in table 6. The earliest known occurrences are from Stela 1 at Tikal (Entry 124, fig. 3*i*). Morley dates the monument, on stylistic grounds, from "very early in Baktun 9, perhaps as early as 9.1.0.0.0" (Morley, 1937–38, vol. 1, p. 297). On the basis of her stylistic analysis, Miss Proskouriakoff accepts a dating from this early period (1950, pp. 106, 195). Associations with death symbols and with a serpent head occur; the emergence of vegetation from the mouth is clear.

Thereafter, floral forms which pass from the mouth have a fairly steady representation in the sculptures. Rather sylized forms which seem to have valid connections with the flower occur at Copan in Katuns 10, 12, and 15, emerging from Wing Panel, Tlaloc, and serpent mouths, respectively. The Wing Panel was later to become a dominant motif at Yaxchilan, perhaps around 9.16.0.0.0. Toward the close of the Classic sequence, at Xultun, probable flowers pass from the mouths of jaguars. At Chichen Itza, in Toltec times, comes a peculiar recurrence of the considerably earlier Palenque-Piedras Negras motif of stems passing horizontally from the corners of the mouth (Entries 24, 72, 95).

Jaguars, or jaguarlike beings, appear early as favored subjects for vegetal associations. Usually a flowerless stem is shown in connection with the back part of the head. The earliest known occurrence of this motif would appear to be in 9.4.0.0.0, at Yaxchilan. Two katuns later, however, a mammiform and sepalless Type M flower is added to the stem; this is the earliest recorded occurrence of the flower with a glyph (Entry 44, Copan). The jaguar has added associations with the flower in later times, such as hands (9.17.0.0.0, Quirigua) and mouth (10.1.0.0.0, Xultun). A flower of suggestively Type E appearance also emerges from a jaguar mouth on Stela 19, Xultun (Entry 136). Morley, while assigning this monument to "the first quarter of Baktun 9," grants that it may have been erected "sometime prior to 9.12.0.0.0" (Morley, 1937–38, vol. 1, p. 392). It is considered later by Proskouriakoff, who, however, assigns it simply to her Late Classic, after 9.8.0.0.0 (Proskouriakoff, 1950, pp. 114–115). The date is of considerable interest, in view of the similarity in treatment of the flower to that at Copan, where similar types appear only in Katun 16, as well as for the possibly early association of the flower with the jaguar's mouth.

Other distinctive associations of the flower tend to come in later. Chronological uncertainties at Yaxchilan and Palenque, in particular, obscure the order and time of appearance of these motifs. In general, the century following the inauguration of Katun 12 saw the floral motif, as depicted in the sculptures, transformed from a fairly simple and standardized to a richly elaborated complex. Perhaps Katun 15 was the time of greatest accretion of new associations. The extent to which the sculptures reflect the situation in other artistic media is, however, a matter of conjecture. The century of elaboration from Katuns 12 to 17 saw a great increase in the number of sculptured monuments erected in the Maya area. This provided a greater opportunity for floral forms to be depicted and, thereby, affords a more reliable range from which to draw conclusions. The peak of a curve showing the incidence of floral motifs would correspond generally to that for the total number of sculptured monuments in Classic Maya art. (Cf. Proskouriakoff, 1950, fig. 3a, and Morley, 1937–38, vol. 4, figs. 148, 149.) If the varied examples at Palenque are correctly attributable to a fairly early period, the peak of the curve for the floral motifs would, in fact, slightly precede that for the total number of comparable monuments. In terms of the total number of representations, however, a second peak would occur in post-Classic times, due to the great popularity of flowers at Chichen Itza.

A growth in popularity in late times, whatever the initial appearance, is indicated for certain motifs. Following such a pattern are the frequently associated traits of figures seated amidst plants and holding them in their hands or arms. It may also hold true for the eyes, nose, and perhaps ear and neck as anatomical sources, at least as opposed to the mouth and head. Serpent Head X, per se, comes into association with vegetation fairly late in the sculptures, mostly after 9.15.0.0.0; yet it is considerably earlier, vegetation at its head, in Esperanza Period pottery at Kaminaljuyu (Entries 211, 212, fig. 4*g*).

The flower-eating fish of the well-known fish and water-plant motif is first definitely dated in 9.15.0.0.0, at Calakmul (Entry 15). Earlier occurrences seem probable at Palenque, however, where they are with the petalless and sepalless Type M flower characteristic of earlier times (fig. 6*f*, perhaps dating from Katun 14). At Copan, the appearance of the fish ushers in a new, petaled form, Type E (Entries 53, 54; 9.16.10.0.0). The Copan data might suggest the simultaneous arrival of a new concept and art form, perhaps the water lily per se as opposed to other flowers or leaves. The Palenque data, on the other hand, would indicate that an association with fish was not inapplicable to the earlier art form. Of course, nothing more than the survival of an old form into a new conceptual setting may be indicated.

In any event, there exists a continuity of tradition which is sizable, regardless of the rather rapid addition, for about a century, of new motifs in the floral art of the sculptures. Whether or not the concept of the water lily was intended throughout, conceptual as well as artistic ties form a widely ramifying complex, some threads of which can be traced back for a full baktun or more.

RESEMBLANCES TO THE LOTUS IN INDIAN ART

This is not the place to go deeply into the complex and highly controversial matter of possible Asiatic affiliations. The water lily, of course, represents but a single basic trait, whatever its elaborations. It should be pointed out, however, that both the water lily of the Maya area (*Nymphaea ampla*) and the Hindu lotus (*Nelumbo* sp.) are members of a single family, the Nymphaeaceae (Conard, 1905; Roys, 1931). The stalks of both rise prominently above the water. This being the case, a certain degree of resemblance in the depictions of the two related plants might well be expected.

A number of conventionalizations strikingly similar to Maya floral forms must be admitted to exist in Southeastern Asiatic depictions of the lotus. In the Maya area, the correspondences seem to occur most notably at Chichen Itza, as Heine-Geldern and Ekholm have pointed out. But they are also marked at Palenque. The portrayal of the water lily as an undulating creeper, the occurrence of reclining human figures holding on to the stalk, and the surging of the stalk from the mouths of monsters are correspondences specifically mentioned by these writers.

Other random resemblances in the depiction of the water lily may be mentioned. The Type C flower which occurs at Chichen Itza, Palenque, and Chinkultic (figs. 5*a*, 1*c*) is closely paralleled in certain representations of the lotus (Coomaraswamy, 1931, pl. 28, No. 1). In Indian art, petals jut out to give the flower a slightly mammiform design of the type encountered at Chichen Itza (fig. 6*h*; Coomaraswamy, 1931, pl. 39, No. 1). Again, a slightly mammiform quality is suggested by outlines, either exterior or within the flower (cf. fig. 4*c* and Coomaraswamy, 1931, pl. 41, No. 4). Multiple scrolls at the flower's base in Indian art correspond to the Flower Element *t* at Chichen Itza (fig. 1*d*) and to turned-back sepals at Quirigua (fig. 2*a*; cf. Coomaraswamy, 1931, pl. 28, No. 2). Basal zoning by a semicircle of short, parallel lines corresponds to Flower Element *l*, in the Maya area known only at Chichen Itza (cf. figs. 1*a*, 6*h*). As a frequent motif in India, a string of pearls hangs down from the flower, comparing in a sense to similar placement of feathers at Chichen Itza (cf. Coomaraswamy, 1931, pl. 28, No. 2, and Flower Element *v*, fig. 1*d*).

As pointed out by Heine-Geldern and Ekholm, the water lily panels at Chichen Itza closely resemble those of Southeastern Asia. The Indian panels are predominantly like Panel Type A of the present paper. Angular and cursive varieties occur, corresponding to the variations in Maya panels (fig. 1*b*–*d*; cf. fig. 1*a* and Coomaraswamy, 1931, pls. 13, No. 1; 39, No. 1). A water-lily wreath on a bowl from Yucatan (fig. 4*d*) compares with the knotted stem in Indian panel art (Coomaraswamy, 1931, pl. 38, No. 3).

Most closely corresponding of the flowers, perhaps, are those from Chichen Itza and Amaravati shown in figures 3*e* and 1*a*. In addition to certain of the features already discussed, the flowers in question have a crosshatched inner zone (Flower Element *m*) and stamen dots (Element *k*) which are virtually identical. In addition, the Indian example has dots within its crosshachure, corresponding thereby to Element *c* of the Maya water lily leaf (cf. fig. 1*b*).

On the other hand, the leaves of the lotus in Indian art appear to differ widely from water lily leaves in Maya art (fig. 1*a*–*c*). Considering the great importance attached to the leaf, this presents a dissimilarity difficult to explain away.

The panel forms at Chichen Itza and Palenque offer the greatest similarities to the Hindu lotus within the Maya area. Other Maya sites contemporaneous with Chichen Itza or Palenque differ more widely from the Indian material. The Type A panel, for example, seems lacking elsewhere. Conceivably, this may be partially correlated with the unusually great use of representative design in connection with architecture at these two sites, instead of on stelae, as was characteristic elsewhere. But earlier Maya sites lacked not merely the panel; Group I flowers tended to be absent, their place being taken by Group IV designs. Lacking petals, sepals, and interior markings, these earlier forms contrast sharply with the wealth of petals depicted in the Indian lotus and differ, likewise, from the later Maya representations.

Maya associations of the water lily having correspondences in Indian art appear to be quite numerous. The stem emerges from the mouth (cf. Entry 124, fig. 3*i*, and Coomaraswamy, 1931, pls. 37, 38). The stalk is held in the hands (cf. Entry 25, fig. 1*d*, and Coomaraswamy, 1931, pl. 30). Reclining human figures are placed amidst the plant (cf. Entry 25, fig. 1*d*, and Coomaraswamy, 1931, pl. 37, No. 2). The stem grows from or is attached to the nose (cf. Entry 129, fig. 3*b*, and Coomaraswamy, 1931, pl. 38, No. 3). The emergence of the stem from the mouth compares further in that full-face designs frequently show the stem to be passing outward horizontally from the corners of the mouth (Entries 24, 72, 95, 99; cf. Coomaraswamy, 1931, pl. 30, No. 2). Another parallel trait, rare if not unique in Maya art, finds the stem which emerges from the mouth being held in the hands of the creature from which it issued (cf. Entry 308 and Coomaraswamy, 1931, pls. 34, 35). And Entry 121b, in which a stem passes horizontally in front view from the eyes into the hands of the same being, offers a related type of comparison. Other anatomical sources may or may not be shared.

From the standpoints of style and symbolic presentation, Chichen Itza and to a lesser extent Palenque show the greatest resemblances to Indian depictions of the lotus. But these correspondences do not have the appearance of a superficial, newly introduced overlay. As indicated by its complex connections with the Long-nosed God, the Serpent Bird, and glyphs, the water lily was deeply rooted in basic Maya symbolism by at least the Maya Middle Period. If Thompson is correct in suggesting that the water lily was the prototype for the day sign Imix and perhaps for the comblike "count" affix in the Introducing and other glyphs, one must postulate a long and important role for this flower. For perhaps the most striking of the mythic associations, the emergence of a plant from the mouth, it can be shown that the concept existed very early in Baktun 9, probably a full half-millenium before the representations at Chichen Itza.

SUMMARY AND CONCLUSIONS

In the preceding pages, a mass of material has been examined in an effort to gain a better picture of the role of the water lily in Maya art. Three broad fields have been partially investigated. These deal with Maya religious symbolism, intersite connections, and possible trans-Pacific importation of the art form into the Maya area.

The most conclusive results have been reached in the field of religious symbolism, where the water lily forms part of a complex with the Long-nosed God and beings perhaps related to the Serpent Bird. The water lily emerges from the mouth and eye and grows from the head, ear, nose, and neck of mythic beings that, for the most part, seem to be the Serpent Bird and Long-nosed God. Less frequently, possible water lilies grow from the head or from behind the ear of the jaguar. Long-nosed Gods, birds, and jaguars sometimes appear in glyphs with the same floral associations that characterize them in nonglyphic representations. The Long-nosed God, as the head variant form for the number 13, appears on occasion, at least, to have exceptionally close relationships with the water lily. Patrons of the months Pop and Pax also seem to have floral associations. For an interpretative study of the water lily in Maya religious symbolism, the reader is referred to Thompson's recent work on Maya hieroglyphic writing (1950).

Suggestive material emerges which bears on the problems of intersite relationships within the Maya area, but it is difficult to evaluate. Detailed studies of many additional art forms, analyzed in the perspective offered by a more complete ceramic knowledge of interregional relationships, are needed. What, for instance, is the significance of the very closely corresponding Yaxchilan and Chichen Itza representations shown in figures 2*d* and 2*f*? These sites are areally and temporally remote, yet nothing that corresponds very closely is known elsewhere in the Maya area. One has the feeling of a vast storehouse of religious and artistic conceptions into which the Maya stelae sculptors only occasionally and sporadically dipped. To the extent that this is so, correspondences that seem to require specifically historical explanations may turn out to have been blind alleys.

Some indications may, nevertheless, point to connections between Yucatan and the Usumacinta Basin that are of a more direct and fundamental nature than, for example, those between Yucatan and the Peten. The Chichen Itza and Yaxchilan representations just cited are a case in point (Entries 22, 152, fig. 2*d*, *f*). As repeatedly brought out, the correspondences between floral representations at Chichen Itza and Palenque are exceptionally close. Chinkultic, again in the western portion of the Maya area, displays a notable resemblance to certain flowers at Chichen Itza. It may be of interest in this general connection that Proskouriakoff and Thompson have pointed out specific artistic and calendric traits that rather strikingly serve to link the Middle Usumacinta with the Puuc region in northern Yucatan (Proskouriakoff and Thompson, 1947; Proskouriakoff, 1950).

The major sites differ interestingly in their portrayal of the water lily. There are indications that Palenque may have been a site of unusual importance in working out certain basic artistic elaborations of this plant. Its tenuous dating, consequently, leaves an important gap in our knowledge of the development of the water lily motif. Chichen Itza was the site where the water lily received its fullest, or at least most extensive, treatment. It may be permissible to characterize Quirigua as a site which drew heavily from several sources in its portrayal of the water lily. Perhaps as a result, its treatment never became as distinctive as, for example, that of Copan or Palenque. But it was cosmopolitan, depicting a wide range of artistic and symbolic forms. Copan and Chichen Itza, more than the other sites, present a picture of chronological change. At first the jaguar and a simple, mammiform type of flower were combined to make a favorite subject at Copan; abruptly emphasis seems to have shifted to a distinctive, asymmetrical flower in repeated association with fish. At Chichen Itza, in Puuc times, a somewhat similar mammiform flower occurred in connection with mask panels on architecture. With the coming of representational sculpture in the Mexican Period, the flower, in its depiction and associations, took on strong aspects of the water lily in the Great Period art of the Central region, particularly that of the western portions of this area.

The suggestion of an Asiatic origin of the water-lily motif seems to receive a certain support because of the striking artistic and associational resemblances to the lotus in Hindu and Buddhist art. It is difficult, however, to reconcile such an origin with the chronological trends in the development of the Maya water-lily motif. Its earliest examples are the least Indianlike, the late examples of Chichen Itza being most like the Indian lotus. The elaborated Chichen treatment of the water lily could not have moved in as a full-blown complex from outside the Maya area, for it is too deeply rooted in earlier artistic and symbolic conventionalizations. This would also appear to be true of the only somewhat less Hindulike water lily of Palenque. To explain the elaborated water lily as of Asiatic derivation, it would appear necessary to postulate a complex series of waves of fundamental influence which accounted for new traits on various time levels. This seems, in fact, to be the position taken by Heine-Geldern and Ekholm. No middle course, which might admit the possibility of a superficial artistic overlay but nothing more, seems possible. At the same time, the water lily seems as basically Mayan as do perhaps most other elements of the culture.

Whatever the actual historical events might have been, several points of theoretical interest suggest reasons why considerable similarity might be expected between the water lily in the art of the Maya and the lotus as depicted in India. The plants are virtually identical in appearance. They are, furthermore, among the larger and more showy flowers, tending to dominate their quiet-water botanical assemblages. A great deal of elaboration, in accordance with the canons of the art treating them, might, therefore, seem a matter of probability. Although the panel designs are especially similar in Maya and Indian floral art, they represent elaborations of basically simple geometric forms. The arts of India and of the Maya tended toward a cursive style. They were, in addition, highly symbolic. The theocratic domination of the arts may, independently, have been a spur to the creation of highly unrealistic situations, wherein old elements within the culture were recombined in accordance with an ever-evolving speculative philosophy. From a different point of view, Spinden discusses aspects of this process under the terms "elaboration," "elimination," and, especially, "substitution" (Spinden, 1913, pp. 38, 41–46). The highly arbitrary situations thus appearing in the art would seem, in turn, to modify the details of further religio-philosophic speculations. If such a functional relationship existed within the theocracies of the Old and New Worlds, the independent creation of a few of the same arbitrary associations would not seem so strange, after all. The "laws of chance" would take on different connotations than have generally been given them. Whether these varied considerations were actually operative, and if so their importance, is of course unknown. But it seems unwise to ignore them in seeking explanations for the truly remarkable parallels that must be admitted to occur.

NOTES ON THE TABLES

In table 1, presences are indicated by "×", absences or probable absences by ----, possible or deviant occurrences by "?", and the presence of associated traits which do not appear in direct connection with the vegetal form by "0". The listing of the associated traits is incomplete, only those cases being given which appear to have a possible conceptual bearing. Absences are recorded when such factors as erosion prevents knowledge of a trait's occurrence, except when closely comparable material at the same site suggests that the trait is present.

In summation (tables 2–6), the incidence of positive occurrences is given under the heading "(×)" and of possible occurrences under the heading "(?)." Associated traits are not totaled.

In tables 1 and 3, flowers which do not conform to one of the 18 recognized types are also designated "?".

Forms which seem to warrant listing under different categories are placed doubtfully under all the categories in question. To indicate this multiple tabulation, parentheses enclose the alternative readings. Partly for this reason, the total number of questionable occurrences may be very great. The heaviness of the uncertain occurrences of head and ear as anatomical sources, for example, is due to the fact that the growth of stems near the jaguar's head is listed doubtfully under both head and ear instead of positively under only one of them. Likewise, doubt occasionally exists whether a floral form grows from the head of a deity or is worn as a "nonhuman headdress."

Deviant traits, furthermore, probably include forms which bear no conceptual relationship to the trait complex under consideration. Thus, the high incidence of doubtfully recorded floral forms emerging from the mouth at Chichen Itza refers to speech scroll-like designs and, therefore, may presumably be ignored for the purposes of the present paper. Similarly, the large number of doubtful occurrences of the hands relates to the holding of paraphernalia that includes a floral form without, however, the flower coming into direct contact with the hands. This is a far cry from the scene shown in figure 1*d*, although a number of intermediate representations are known.

Deviant occurrences in the artistic elements and types give totals which appear to be of more significance. This is because the forms, while often divergent, nevertheless tend to vary around certain central tendencies. The "either-or" quality is, therefore, less than in the case of the symbolic associations, except in the tabulation of either two or three sepals (Flower Elements *b*, *c*, and, in functional relationship, *h*).

Table 1 gives the raw data upon which subsequent tables are based. "F" and "P," under the entry "Mask panel," indicates whether the mask is in full face or profile. The date for each monument is given according to the katun in which it falls. Sites are arranged alphabetically and the monuments within a site, when possible, chronologically. Dates are based on Morley (1937–38) and, when indicated by an asterisk, Proskouriakoff (1950). Entry numbers 1 through the 100's refer arbitrarily to sculptures and murals; numerals in the 200's refer to ceramics and in the 300's to the codices. An entry may refer to one or more representations, as defined in footnote 8. These representations may differ artistically, in over-all type, or in the indirect, "0" type of associations (in which case all the pertinent data are given). They may not differ, however, in their symbolic associations (for which presences are indicated by "×" and "?"). For a closely united group of separate media, such as different lintels in a single structure (Yaxchilan) or different pages in a single codex, a single entry is given if the above criteria are satisfied.

Table 2 gives the incidence of the artistic elements in the portrayal of the water lily leaf. The number of leaves, not of representations, is given. Occurrences are presented according to site totals.

Table 3 gives the incidence of the Flower Types, according to the totals for each site. The individual flower is the unit to which the numbers refer.

Table 4 gives the incidence of Flower Elements, according to site totals. Numbers refer to flowers.

Table 5 gives the incidences of Over-all Types and the various symbolic associations, according to site totals. The representation is the unit to which the numbers usually refer, but the number of monuments depicting tabulated plant forms at each site are also given.

Table 6 also gives the incidences of the Over-all Types and the various symbolic associations. Differing from previous listings, however, the occurrences are given chronologically not spatially. In this case, furthermore, the numbers refer to the total number of monuments rather than to that of the representations on them. The number of sites and monuments depicting tabulated forms at a given period are also shown.

Additional information on the reading of the tables is given in footnotes 5, 6, and 8 and, in the text, on pages 83 to 84, 92 to 93, 97 to 98, 100, 102, 113, 114. For untabulated traits, see pages 98 to 99, 106, 109 to 110.

TABLE 1.—*Symbolic associations, artistic features, and miscellany (individual representations)*

Entry	Date	Probability	Type	Number of representations	Glyph	Death symbols	Human head-dress	Non-human head-dress	Association of plant						
									Mask panel	Long-nosed God (body)	Serpent Head X, &c	Wing Panel	Serpent Bird	Bird	Jaguar
1. Bonampak, Palace 1, Rm. 1	9.17(?)*	B	Ia, b	1					P		×				
2. Bonampak, Palace 1, Rm. 1	9.17(?)*	B	Ia	1					F						
3. Bonampak, Palace 1, Rm. 1	9.17(?)*	B	Ia	1		×			P		×				
4. Bonampak, Palace 1, Rm. 1	9.17(?)*	B	Ia	1					P		×				
5. Bonampak, Palace 1, Rm. 1	9.17(?)*	A	(Ia, IIc) IIIa.	6			×	(?)			×				0
6. Bonampak, Palace 1, Rm. 1	9.17(?)*	A	Ib	1			×								
7. Bonampak, Palace 1, Rm. 1	9.17(?)*	A	IIc?, IIIa?	1			×	(?)			×				
8. Bonampak, Palace 1, Rm. 1	9.17(?)*	A, B	Ib	1			×							0	
9. Bonampak, Palace 1, Rm. 1	9.17(?)*	A	Ib	1			×	×						×	
10. Bonampak, Palace 1, Rm. 1	9.17(?)*	A	Ib, IIIa	1			×								
11. Bonampak, Palace 1, Rm. 1	9.17(?)*	A	Ib	1			×								
12. Bonampak, Palace 1, Rm. 1	9.17(?)*	A	Ib	1			×								
13. Bonampak, Stela 2	9.17.(?)*	A	IIc	1			×	×			×				
14. Bonampak, Stela 2	9.17.(?)*	B	Ib	1			×					?			
15. Calakmul, Stela 54	9.15	A	IIc	1			×								
16. Calakmul, Stela 53	9.15(?)	B	?	1(?)			?								
17. Cancuen, Altar 1	9.18	B	Ia	1			×								
18. Cancuen, Stela 1	9.18(?)	A	II–?	1					F					×	
19. Chichen Itza, Tigers, Chamber A		A	IIa	2		×			F(?)						
20. Chichen Itza, Tigers, Chamber A		B	Ia	2											
21. Chichen Itza, Tigers, Chamber A		B	II–?	3(?)			×								
22. Chichen Itza, Tigers, Chamber E		A	IIc	2				(?)	F						
23. Chichen Itza, Tigers, Chamber E		A	Ib	1			×								
24. Chichen Itza, Tigers, Chamber E		A	IIb	1					F						
25. Chichen Itza, Tigers, Chamber E		A	II–?	2					P					×	
26. Chichen Itza, Tigers, Chamber E		A	II–?	1		?			F					×	
27. Chichen Itza, Tigers, Chamber E		A	IIb	1		×			F						
28. Chichen Itza, Tigers, Chamber E		A	II–?	2											
29. Chichen Itza, Tigers, Chamber E		A	IIe	2							×				
30. Chichen Itza, Ball Court, Chamber C.		A–	II–?	1					F(?)						
31. Chichen Itza, Ball Court, Chamber C.		A–	II–?	2		0									
32. Chichen Itza, Ball Court, Chamber C.		A–	II–?	1											
33. Chichen Itza, Ball Court, Chamber C.		A, B	II–?	4(?)		0								0	
34. Chichen Itza, Ball Court, Chamber C.		A	II–?	1		0									

TABLE 1.—*Symbolic associations, artistic features, and miscellany (individual representations)*—Continued

Entry	Date	Probability	Type	Number of representations	Glyph	Death symbols	Human headdress	Nonhuman headdress	Association of plant						
									Mask panel	Long-nosed God (body)	Serpent Head X, &c	Wing Panel	Serpent Bird	Bird	Jaguar
35. Chichen Itza, Ball Court		A	II-?	1		×									
36. Chichen Itza, Chac Mool		B	IIa	2											
37. Chichen Itza, Chac Mool		B	IIa	10											
38. Chichen Itza, Chac Mool		B	Ib	2			×	×			×				
39. Chichen Itza, Warriors		B	IIa	2			(?)								
40. Chichen Itza, N. W. Colonnade		B	IIa	1			(?)								
41. Chichen Itza, N. W. Colonnade		B	IIa	1			(?)								
42. Chinkultic, Ball Court Marker	"9.7"	B	Ib	1		?	×								0
43. Chinkultic, Stela 7	9.17	A	Ib	1			×								
44. Copan, Stela 9	9.6	B	Ib	2	×										×
45. Copan, Stela 2	9.10(?)	A-	IIe?	1		0	×		F(?)		0				?
46. Copan, Stela 2	9.10(?)	B	Ia	2			×				0	×			
47. Copan, 2d Ball Court	9.11.(?)*	B	IId	2	?										
48. Copan, 2d Ball Court	9.11.(?)*	B	Ib	1			×								
49. Copan, Altar K	9.12	B	Ib	1	×										×
49a. Copan, Stela 6	9.12	B	Ia	1			×								
49b. Copan, Stela A	9.15	B	Ia	2		0	×				?				
49c. Copan, Stela H	9.15.(?)	B	Ia	1				×					×		
50. Copan, Stela B	9.15	A	IIIb	2		×			P		×				
51. Copan, Stela B	9.15	B	IIIa	1							×			0	
52. Copan, Stela B	9.15	B	IIIa	1							×			0	
53. Copan, Stela N	9.16	A	IIc	2		?	×	×							
54. Copan, Stela N	9.16	A	Ib	2			?	×			×				
55. Copan, Altar R	9.16	A	Ib?	1		×			F						
56. Copan, Altar W'	9.17 (?)	A	Ib	1				×	0(F)		0				
57. Copan, Temple 11	9.17 (?)	A	Ib	2(?)		×		×			0				
58. Copan, Altar T	9.17 (?)	A	Ib	1								0		0	
59. "Cozumel," Stela 1 (Chilib ?)		B	Ib	1			(?)								
59a. El Chicozapote, Lin. 1		B	Ia	1					0(P)						
59b. Etzna, Stela 7	9.15.(?)*	B	Ia	1											
60. Ixkun, Stela 4	9.19.(?)*	B	IIc	1			×	×			×				
61. Ixkun, Stela 4	9.19.(?)*	B	Ib?	1			×					?			
62. Ixkun, Stela 1	9.18	A	IIc, IIc?	2			×	×			×				
63. La Amelia, Stela 1	10.0.(?)*	A	IIc	1			×								
64. La Honradez, Stela 4	9.18.(?)	B	Ib	1			×								
65. La Honradez, Stela 4	9.18.(?)	B	IIIa	1			×								×
66. La Mar, Stela 2	9.18	A	IIc	4(?)			×	×			×				
67. Naranjo, Stela 1	9.13.(?)	A	(II-?, IIIb)	1					P		?				
67a. Naranjo, Stela 14	9.18	B	Ia	1											
68. Palenque, House C	9.14(?)*	A	IV	1		?		(?)	F						

69. Palenque, House C	9.14(?)*	A	IIc	2	×			×			×				
70. Palenque, House A	9.14(?)*	A	Ia	3			×					×			
71. Palenque, House B		A	IIa	1										0	
72. Palenque, House E		A	IIIb	1		0			F		0		×		
73. Palenque, House E		A	IIe	1			×				×				
74. Palenque, House E	9.12(?)*	B	Ib	1			×								
75. Palenque, House E	9.12(?)*	B	IIIb	1											×
76. Palenque, House E (?)	9.12(?)*	A	IIb	1					0(P)		0				
77. Palenque, House D, Pier c	9.16(?)*	A	IIf	1		×			F?, P?		×				
78. Palenque, House D, Pier f	9.16(?)*	A	IIf	1		×			P?		×				
79. Palenque, House D, Pier f	9.16(?)*	B	Ib?	1			×	(?)							
80. Palenque, House D, Pier d	9.16(?)*	A	IIe	1			×				×				
81. Palenque, Enclosed Corridor		B	IIa	1											
81a. Palenque, Tower		B	Ia, Ib	1				×		×					
81b. Palenque, Tomb Group IV		A-	Ib	2			×								
81c. Palenque, Sun	9.14.(?)*	B	Ia	4(?)											
81d. Palenque, Sun	9.14.(?)*	B	Ia	1		×			F					0	0
81e. Palenque, Palace, North Gallery		A	IIc	1			×								
81f. Palenque, Palace, North Gallery		A	IV, ?	1			×								
81g. Palenque, Palace, North Gallery		B	IIIa	1											×
81h. Palenque, Inscriptions		A	IIe	1						×					
82. Palenque, Sun	9.14(?)*	B	Ib	2			×								
83. Palenque, Sun	9.14(?)*	B	IIIa	1											×
84. Palenque, Cross	9.14(?)*	A	Ib	2				(?)	F						
85. Palenque, Cross	9.14(?)*	A	?	1			×				0	×		0	
86. Palenque, Cross	9.14(?)*	B	IIIa	1											×
87. Palenque, Cross	9.14(?)*	B	Ia	1		?		×		×					
88. Palenque, Cross	9.14(?)*	B	Ib	3		0	×						0	0	
89. Palenque, Foliated Cross	9.15(?)*	B	Ib	2		0	×						0		
90. Palenque, Foliated Cross	9.15(?)*	B	IIIb	1		0				×			0		
91. Palenque, Foliated Cross	9.15(?)*	B	Ib	1	×										
92. Paraiso, trough		A	IIb	1		×									
93. Paraiso, trough		A	IId	1											
93a. Piedras Negras, Stela 33	9.10(?)	B	Ib?	1			×								?
94. Piedras Negras, Stela 6	9.12	B	IIIb	1		0			F		0		×		
95. Piedras Negras, Stela 8	9.14(?)	A	IIb	1			×		F(?)						
96. Piedras Negras, Stela 2	9.13	B	Ia	1(?)			×								×
97. Piedras Negras, Stela 11	9.15	B	IIIb	1		0			F		0		×		
98. Piedras Negras, Stela 10	9.15	B	Ib, IIIa	1											×
98a. Piedras Negras, Stela 40	9.15	B	IIIa	1		0	×								?
99. Piedras Negras, Stela 14	9.16(?)	B	IIIb	1		0			F		0		×		
100. Piedras Negras, Stela 14	9.16(?)	A	Ib	1			×							×	
101. Piedras Negras, Stela 13	9.17	B	Ib	1			×								
102. Piedras Negras, Stela 13	9.17	B	Ia	1			×								?
102a. Piedras Negras, Miscel. Sculp. Stone 16.	9.17.(?).*	A-	Ib	1				×							0
103. Piedras Negras, Sacrificial Rock		B	Ia	2			×								
103a. Quirigua, Stela H	9.16	B	Ib?	1(?)											
103b. Quirigua, Stela F	9.16	A-	IIc	2				×		×			0		
103c. Quirigua, Stela F	9.16	B	Ia	1		×									
104. Quirigua, Stela D	9.16	A	II-?	1	×	×					×			×	
105. Quirigua, Stela D	9.16	A	Ib	1	×			×							
106. Quirigua, Stela D	9.16	B	Ia	1	×	×		(?)							

TABLE 1.—*Symbolic associations, artistic features, and miscellany (individual representations)*—Continued

Entry	Date	Probability	Type	Number of representations	Glyph	Death symbols	Human headdress	Non-human headdress	Association of plant						
									Mask panel	Long-nosed God (body)	Serpent Head X, &c	Wing Panel	Serpent Bird	Bird	Jaguar
107. Quirigua, Stela A	9.17	B	IIa?	1		×	×	(?)	F(?)						
108. Quirigua, Stela A	9.17	A	IIa	1							×	×	?		?
109. Quirigua, Stela C	9.17	A	IIa	1							×	×	×		
110. Quirigua, Stelae A, C	9.17	B	Ib	2(?)		×									
111. Quirigua, Zoomorph B	9.17	A–	(Ib, IIa)	2	×										
112. Quirigua, Zoomorph B	9.17	A	Ib	1	×	0		×							
113. Quirigua, Zoomorph B	9.17	A	Ib	1	×			×		0	×				
114. Quirigua, Zoomorph B	9.17	B	Ib	1	×			×						×	
115. Quirigua, Zoomorph P	9.18(?)	A	IIa	1			×					×			
116. Quirigua, Zoomorph P	9.18(?)	B	Ia	1		×					×				
117. Quirigua, Zoomorph P	9.18(?)	B	Ia	1		?				×					
118. Quirigua, Zoomorph P	9.18(?)	A	IV	2		?		(?)	F		×				
119. Santa Rita, Mound 1		B	Ia?	1											
120. Santa Rita, Mound 1		B	Ib	3(?)		?									
121. Santa Rita, Mound 1		A–	IIIb	1											
121a. Santa Rosa Xtampak, Palace		B	Ib?	1			×							?	
121b. Sayil, Str. 4B1		A	(IIa, IId)	1		×			F						
122. Seibal Stela 10	10.1	B	Ib?	1							0				
122a. Seibal, Stela 10	10.1	B	Ib?	1											
123. Seibal, Stela 11	10.1	A	Ib	1			×								
124. Tikal, Stela 1	9.0(?)*	B	Ib	2		×					?				
125. Tikal, Stela 20	9.16	B	Ib?	1											×
126. Tikal, Temple IV	9.16.(?)	B	Ib?	2							0				×
127. Tulum, Frescoes		B	Ib	2						?					
128. Tulum, Frescoes		B	Ib	1											
129. Tulum, Frescoes		A	IIb	1							×				
130. Tulum, Frescoes		B	Ib	1											
131. Tulum, Frescoes		A–	IIb	2											
132. Tulum, Frescoes		B	IIb	4											
133. Tulum, Frescoes		B	Ib	3(?)											
134. Uxul, Stela 6	9.12(?)	B	Ib	1			×								0
134a. Xcalumkin, Initial Series Bldg	9.16	B	Ia	1			×								
134b. Xcalumkin, Glyphic Group, North Bldg.	9.16	B	Ib	1			×								
134c. Xcocha, Glyphic Band Bldg		A–	Ib?	1			×								
134d. Xculoc, Sculptured Columns Bldg		A–	Ia	2											
135. Xultun, Stela 18	9.12(?)*	B	Ia, Ib?	2											×
136. Xultun, Stela 19		A	Ib?	1											×
137. Xultun, Stela 5	9.18(?)*	B	Ib	1(?)											?
138. Xultun, Stela 1	10.1.(?)	B	Ib?	1(?)											?

139. Xultun, Stela 3	10.1	B	Ib, IIIa?	1											X
140. Xultun, Stela 10	10.3	A-	Ib, IIIa	1											X
140a. Yaxchilan, Stela 27	9.4	B	IIIa	1		0	X								?
141. Yaxchilan, Str. 34, Lin. 4		B	IIIa	1			X								X
142. Yaxchilan, Str. 1 Lin. 6	9.16(?)*	A	IIc	1			X	X			X				
143. Yaxchilan. Str. 42, Lin. 42, 43	9.16(?)*	B	Ib?	3			X				0	X			
144. Yaxchilan, Str. 23, Lin. 26	9.17(?)*	B	IIIa	1											X
145. Yaxchilan, Str. 20, Lin. 13, 14	10.0(?)*	B	Ib?	4			X				0	X			
146. Yaxchilan, Str. 54, Lin. 54, 58	9.16.(?)	B	Ib?	3(?)			X				0	X			
147. Yaxchlian, Str. 54, Lin. 54, 58	9.16.(?)	B	Ia	4(?)			X	?			?			0	
148. Yaxchilan, Str. 33, Lin. 1, 2	9.16	B	Ib?	2			X				0	X			
149. Yaxchilan, Str. 33, Lin. 2, 3	9.16	B	Ib?	2							0				
150. Yaxchilan, Str. 33, Lin. 3	9.16	B	Ib?	1			X				0				
151. Yaxchilan, Str. 33, Lin. 1	9.16	B	Ia	1			X				0				
152. Yaxchilan, Stela 7	9.15(?)*	A	IIa	1					P		X				
153. Yaxchilan, Str. 55, Lin. 52, 53	9.16(?)	B	Ib?	2			X				0	X			
154. Yaxchilan, Str. 55, Lin. 53	9.16(?)	B	Ia?	1			X	?			0				
155. Yaxchilan, Stela 4	9.17.(?)*	B	Ia	1							?		0		
156. Yaxchilan, Stela 20	9.18.(?)*	B	IIIa	1			X								X
201. Chama		A	IIe	1		0					X				0
202. Chama		B	(Ib, IIIa)	1			X								X
203. Chama		A-	Ib?	1		X									X
204. Chama		A-	Ib	3			X	X							
205. Chama		A	Ib, IIe?	2					P		X				
206. Chama		A	Ib?	1				X							
207. Chama		B	IIa	1			X							X	
208. Chajcar		A	IIc?	2		(?)		(?)	P		X				
209. Chajcar		A	Ia	3(?)							0				
210. Copan		B	IIIa	1											X
211. Kaminaljuyu		B	Ib	2		X			P		X				
212. Kaminaljuyu		B	Ib	2		X		X			X				
213. Nebaj		A	Ib	1			X								
214. Rio Hondo		A	Ia	4		X		(?)	P		X				
215. Rio Hondo		A-	IId?	1										?	
216. San Agustin Acasaguastlan		B	Ib	6				X						X	
217. San Agustin Acasaguastlan		B	Ia	1							(?)			(?)	
217a. "San Agustin Acasaguastlan"		B	Ib	1			X								
217b. "San Agustin Acasaguastlan"		B	Ia	1			X								
217c. Uaxactun		B	Ib	1			X								?
217d. Yalloch		B	Ib	1										0	
218. Yucatan		B	Ia, Ib	1		X			P		X				
219. Yucatan		A	(IIa, IIb)	1							0				X
220. Yucatan		B	Ib?	1				?			?				?
221. Yucatan		A	Ib?	1											0
222. Yucatan		A	IId	1					P		X				
301. Dresden 65a		A	IIb	1						X					
302. Dresden 67b		A	Ib	1						X					
303. Dresden 29c		A-	IIIa	1						X					
304. Dresden 44c		A-	IIIb?	1						X					
305. Dresden 67a		B	IIIb?	1						X					
306. Dresden 15b		B	IId?	1	?					X					

TABLE 1.—*Symbolic associations, artistic features, and miscellany (individual representations)*—Continued

Entry	Date	Probability	Type	Number of representations	Glyph	Death symbols	Human headdress	Non-human headdress	Association of plant						
									Mask panel	Long-nosed God (body)	Serpent Head X, &c	Wing Panel	Serpent Bird	Bird	Jaguar
307. Dresden 48a, 49a		B	(Ib, IIa)	2							0				
308. Dresden 38b		A-	IIIa	1										×	
309. Dresden 8a		A	Ib	1											×
310. Dresden 13a		A	IIc	1			×	×		×					
311. Dresden 25c		B	Ia	1				×		×					
312. Dresden 7c		B	Ia	1				×						×	
312a. Dresden 56a		B	Ia	1						0					
312b. Dresden 50		B	Ia	1		0									
313. Madrid 10c		B	IIIb	1											
314. Madrid 29a		B	II-?	1											
315. Madrid 65b		B	Ib	1						?					
316. Madrid 70b		B	Ib	1		×	×				×				
317. Perez 22		B	IIIb	1											

TABLE 1.—*Symbolic associations, artistic features, and miscellany (individual representations)*—Continued

Entry	Anatomical source							Stem connects heads	Head set against plant	Figures amidst plant	Fish eats flower	Panel type	Leaf elements	Flower type	Flower elements
	Hands, arms	Neck	Ear	Nose	Eyes	Mouth	Head								
1. Bonampak, Palace 1, Rm. 1			×				×							(F, H), ?	*b, d?, i.*
2. Bonampak, Palace 1, Rm. 1							×							?	*c?, i.*
3. Bonampak, Palace 1, Rm. 1			×											H	*c.*
4. Bonampak, Palace 1, Rm. 1							×							?	*b, i?.*
5. Bonampak, Palace, Rm. 1							(?)				×			I	*(b, c).*
6. Bonampak, Palace 1, Rm. 1											×			A	*a, c.*
7. Bonampak, Palace 1, Rm. 1							(?)						*f, g?, h*	(A, H)	*a?, (b, c).*
8. Bonampak, Palace 1, Rm. 1	?		×											(A, H), K?	*c?, d, t.*
9. Bonampak, Palace 1, Rm. 1			×											A, I	*a, c, d, i.*
10. Bonampak, Palace 1, Rm. 1			×				?							(A, B)	*a, c.*
11. Bonampak, Palace 1, Rm. 1			×				×							(A, B), I	*a?, (b, c).*
12. Bonampak, Palace 1, Rm. 1							×				×			B?	*a?, r.*
13. Bonampak, Stela 2											×		*f, g?, h, l*	B	*a, b, i, u.*
14. Bonampak, Stela 2			?											I?	*d?.*
15. Calakmul, Stela 54											×		*d, f, g?, h, i, j.*	A	*a, c, i?, v?.*
16. Calakmul, Stela 53											?				
17. Cancuen, Altar 1														G	*b, t.*
18. Cancuen, Stela 1												B?			
19. Chichen Itza, Tigers, Chamber A					×							C		A, ?	*a, b, f, h, l, p, q, t.*
20. Chichen Itza, Tigers, Chamber A														A	*a, b, f?, g, t?, v.*
21. Chichen Itza, Tigers, Chamber A			×							×		?		(K, L), ?	*b, d, f, o?, p?, t, u.*
22. Chichen Itza, Tigers, Chamber E					×		(?)			?	×	C	*e, f, g, j*	A, B	*a, b, n?, u.*
23. Chichen Itza, Tigers, Chamber E											×			A	*a, b, h?, k, m, q, t.*
24. Chichen Itza, Tigers, Chamber E						×	?		×		×	A, C?	*a, f, g?, j*	A, D, (H, M), Q.	*a, b, d, e?, g, h, l, q, t.*
25. Chichen Itza, Tigers, Chamber E	×						×			×		A		A, F, N, O, Q, ?.	*a, b, l, m, q, s, t, v.*
26. Chichen Itza, Tigers, Chamber E			×							×		A		A, N, ?	*a, b, g, m, o, q, r, t, v.*
27. Chichen Itza, Tigers, Chamber E			×						×		×	A	*a, b, f?, g?, h, j, k.*	A, Q, ?	*a, b, d, l, m, t.*
28. Chichen Itza, Tigers, Chamber E						?								A, C, E?, J, K, N, O, Q?, R, ?.	*a, b, c, d, f, h?, j, k?, l, m, p, s.*
29. Chichen Itza, Tigers, Chamber E						?	×							?	*d, f?, h?.*
30. Chichen Itza, Ball Court, Chamber C.	×									×		A		J, ?	*d, f.*
31. Chichen Itza, Ball Court, Chamber C.										×		A		J, ?	*d.*
32. Chichen Itza, Ball Court, Chamber C.										×		A		J, O, P, ?	*d, m?, t.*

TABLE 1.—*Symbolic associations, artistic features, and miscellany (individual representations)*—Continued

Entry	Anatomical source							Stem connects heads	Head set against plant	Figures amidst plant	Fish eats flower	Panel type	Leaf elements	Flower type	Flower elements
	Hands, arms	Neck	Ear	Nose	Eyes	Mouth	Head								
33. Chichen Itza, Ball Court, Chamber C.						?								C, ?	*a, c, d, j, p?.*
34. Chichen Itza, Ball Court, Chamber C.										?				C, ?	*a, c, d, k?, p?.*
35. Chichen Itza, Ball Court		×								×				C, I, K, O?, ?.	*a, c, d, j, o, r.*
36. Chichen Itza, Chac Mool						?				×			?	I, J, ?	*d, t?.*
37. Chichen Itza, Chac Mool						?				×				I, J, K, L, ?	*d, o?, r.*
38. Chichen Itza, Chac Mool														A	*a, b, l, v.*
39. Chichen Itza, Warriors							(?)							I, ?	*d, f, r.*
40. Chichen Itza, N. W. Colonnade							(?)							?	*d.*
41. Chichen Itza, N. W. Colonnade							(?)			×				J, ?	*d, f, s?.*
42. Chinkultic, Ball Court Marker	?								?					N	*f, p.*
43. Chinkultic, Stela 7														C	*a, c, j.*
44. Copan, Stela 9			(?)				(?)							M	*f, p, q.*
45. Copan, Stela 2							?		?			B.		M	*f, p, q.*
46. Copan, Stela 2						?								I	*(b, c), h, q?.*
47. Copan, 2d Ball Court														H, ?	*b, c, f, q, t.*
48. Copan, 2d Ball Court														N?	*f, h.*
49. Copan, Altar K			(?)				(?)							N	*f.*
49a. Copan, Stela 6						×								H?	*b, (h, i), q.*
49b. Copan, Stela A	O					×								?	*m.*
49c. Copan, Stela H														F	*b, i, (n, p).*
50. Copan, Stela B	×	×			×			×		×		D			*r.*
51. Copan, Stela B	×	(?)				(?)									
52. Copan, Stela B		×													
53. Copan, Stela N											×		*b, f, g, h, k*	E	*a, b?, e, i?, j, k?, u.*
54. Copan, Stela N											×			E	*a, b?, e, i?, j. k?.*
55. Copan, Altar R			×											D	*a, (b, c), h?, i.*
56. Copan, Altar W[1]														E	*a, b?, e, k?, u?.*
57. Copan, Temple 11														E	*a, e, u.*
58. Copan, Altar T	?										×			E	*a, b?, e.j, (n, p), u.*
59. "Cozumel, Stela 1" (Chilib?)							(?)							A	*a, b, v.*
59a. El Chicozapote Lin. 1														H?, ?	*a?, b, d.*
59b. Etzna, Stela 7														N?	*h.*
60. Ixkun, Stela 4														?	*c?, h?.*
61. Ixkun, Stela 4						?								I?	*b?.*
62. Ixkun, Stela 1											×		*b, f?, h, k*	A, B	*a, b, g.*
63. La Amelia, Stela 1													*f, g, h, l*	E?	*a?, b?, f.*
64. La Honradez, Stela 4														I?	*b, i.*
65. La Honradez, Stela 4			(?)				(?)								
66. La Mar, Stela 2													*b, f, g?, h, k*	B, D, ?	*a, b, d?, r, t?, u.*

67. Naranjo, Stela 1												?			
67a. Naranjo, Stela 14														N?	h.
68. Palenque, House C							(?)						a, c, f, g?, h, j, m.		
69. Palenque, House C													f, g?, h, l	D?, Q?	a, b.
70. Palenque, House A						?					×			M	p, q.
71. Palenque, House B												A?, B?, F.		I	(b, c), h?, k?, r?.
72. Palenque, House E						×						B			
73. Palenque, House E							×							H	b, f, i, q.
74. Palenque, House E														(H, I)	b, f, i, q?.
75. Palenque, House E			(?)				(?)							?	
76. Palenque, House E (?)	×												b, c, f, g, j, m?.	A	a, c, u?.
77. Palenque, House D, Pier c			?				×					A	a, c, f, g, h, i, j, k?, m.	A, (C, D)	a, b?, c, h?, k, n, q, s, t?.
78. Palenque, House D, Pier f		×					×		×			A, F?	a, c, f, g, j, m.	A	a, c, k, n, q?
79. Palenque, House D, Pier f							(?)							I	b, f.
80. Palenque, House D, Pier d							×							N	h.
81. Palenque, Enclosed Corridor	×									×		B, F		?	b?, e?. i, t?.
81a. Palenque, Tower			×											F?, H, ?	a?, b, f, g, h?, i, k?, q, t?.
81b. Palenque, Tomb Group IV														D?	a, c, i, u.
81c. Palenque, Sun														H	b, h?, p, q.
81d. Palenque, Sun														A?	a, k, m, v?
81e. Palenque, Palace, North Gallery											×		b, f, h	H	(b, c), h, r, s.
81f. Palenque, Palace, North Gallery													d, f, g, h		u.
81g. Palenque, Palace, North Gallery			(?)				(?)								
81h. Palenque, Inscriptions							×							H	b, f, g, k?, q.
82. Palenque, Sun														H, I?	b, f, q.
83. Palenque, Sun			(?)				(?)								
84. Palenque, Cross											×			I	d,n.
85. Palenque, Cross						?					×			?	r.
86. Palenque, Cross			(?)				(?)								
87. Palenque, Cross														H	b, h?, q.
88. Palenque, Cross														H, I, N?	b, d?, f, q.
89. Palenque, Foliated Cross														H, N?	b?, d?, f, p, q.
90. Palenque, Foliated Cross	×								×	×		?			
91. Palenque, Foliated Cross														H	b, q.
92. Paraiso, trough			?						×		?	?	a, c, f, g?, j	E?	a, (b, c), e, i?, t?.
93. Paraiso, trough									?			?		A	a, c, f?, o, t?.
93a. Piedras Negras, Stela 33			(?)				(?)				0			M?	b?, f, q?.
94. Piedras Negras, Stela 6				?								C			
95. Piedras Negras, Stela 8						×	×						f, g, l	(A, H)	a?, b, f?, i, q, s?.
96. Piedras Negras, Stela 2			(?)				(?)							?	e?.
97. Piedras Negras, Stela 11				?								C?			
98. Piedras Negras, Stela 10			(?)				(?)							?	
98a. Piedras Negras, Stela 40			(?)				(?)								
99. Piedras Negras, Stela 14				×								C			
100. Piedras Negras, Stela 14			(?)			×	(?)							H	b, f, i, q?.
101. Piedras Negras, Stela 13														F	b, f, i.
102. Piedras Negras, Stela 13			(?)				(?)							?	

TABLE 1.—*Symbolic associations, artistic features, and miscellany (individual representations)*—Continued

Entry	Anatomical source							Stem connects heads	Head set against plant	Figures amidst plant	Fish eats flower	Panel type	Leaf elements	Flower type	Flower elements
	Hands, arms	Neck	Ear	Nose	Eyes	Mouth	Head								
102a. Piedras Negras, Miscel. Sculp. Stone 16.														H	*(b, c), f, i.*
103. Piedras Negras, Sacrificial Rock														H?	*b?, q?.*
103a. Quirigua, Stela H														M?	*i, q.*
103b. Quirigua, Stela F													*f, g, h, l*	?	*b.*
103c. Quirigua, Stela F														H, ?	*b, g, p?. q, v?.*
104. Quirigua, Stela D			×			×		×			?	D		H, ?	*b, g, h, p, q. t?.*
105. Quirigua, Stela D														E?	*b?, e, j?, r.*
106. Quirigua, Stela D							(?)							F?	*(b, d), i.*
107. Quirigua, Stela A				×			(?)					E		F	*b, g?, i?.*
108. Quirigua, Stela A	×	×				?		×	×	×		E		H?	*(b, c), f?, h?, q?.*
109. Quirigua, Stela C	×	×				×		×		×		E		H	*b, i, q, r.*
110. Quirigua, Stelae A, C														?	*b?.*
111. Quirigua, Zoomorph B						×								?	*f.*
112. Quirigua, Zoomorph B														E?	*b?, e, i.*
113. Quirigua, Zoomorph B														F	*b, u.*
114. Quirigua, Zoomorph B														E?	*a?, b?, e?, u.*
115. Quirigua, Zoomorph P	×	(?)				(?)						B		F?, I?	*a?, (b, c), f, h, i, r, u?.*
116. Quirigua, Zoomorph P			?											F	*b, i, v?.*
117. Quirigua, Zoomorph P			×											F	*b, g, k?.*
118. Quirigua, Zoomorph P		×					(?)		×			B, ?	*a, b, c, f, g, j, m.*		
119. Santa Rita, Mound 1			?	?										H?, I	*(b, c), h?. o, q.*
120. Santa Rita, Mound 1	?													H, I?	*b, d, f, h, k?, o, q.*
121. Santa Rita, Mound 1	0												*b, c, g?, j*	I, N, P, R	*(b, c). h?, o, p?, q.*
121a. Santa Rosa Xtampak, Palace				×										K	*d, j?, o.*
121b. Sayil, Str. 4B1	×				×							(A, C)		?	*o?*
122. Seibal, Stela 10		?							0					I	*(b, c), p.*
122a. Seibal, Stela 10														I	*(b, c), i.*
123. Seibal, Stela 11											×			E? G	*a?, b, f, m?, r.*
124. Tikal, Stela 1						×								N	*f.*
125. Tikal, Stela 20			(?)				(?)							H	*b?, q?.*
126. Tikal, Temple IV			(?)				(?)							?	*b, f, h, i, t.*
127. Tulum, Frescoes				×										K	*d, f, o.*
128. Tulum, Frescoes				×										H, K	*(b, c), d. h?, o, q.*
129. Tulum, Frescoes				×			×						*g?, j?, m*	K	*d, p.*
130. Tulum, Frescoes	×													Q	*d, h?.*
131. Tulum, Frescoes	?												*b, g?. i, j, l?*	O	*d, h?, i?, p.*
132. Tulum, Frescoes												B?, C?, E?.	*f, g?, i, l, m.*	H, I, K, P, Q, R, ?	*(b, c), d, h?, i?, o, p?, q.*

133. Tulum, Frescoes														H?, I, K, P, Q.	*b?, c, d, h?, j, o, p, q.*
134. Uxul, Stela 6														H	*b, f, i.*
134a. Xcalumkin, Initial Series Bldg.														B	*a, b, v.*
134b. Xcalumkin, Glyphic Group, North Bldg.														B?	*a, m, v.*
134c. Xcocha, Glyphic Band Bldg.														A	*a, b, f, k?, v.*
134d. Xculoc, Sculptured Columns Bldg.														A	*a, c, v.*
135. Xultun, Stela 18			(?)				(?)							M, N, ?	*b, i, q.*
136. Xultun, Stela 19	?					×								E?	*a, b?, j, t?, u?.*
137. Xultun, Stela 5	?					?								?	
138. Xultun, Stela 1	?					?								?	
139. Xultun, Stela 3	?		(?)			×	(?)							Q	*d.*
140. Xultun, Stela 10	?		(?)			×	(?)							Q	*d.*
140a. Yaxchilan, Stela 27			(?)				(?)								
141. Yaxchilan, Str. 14, Lin. 4			(?)				(?)								
142. Yaxchilan, Str. 1, Lin. 6											×		*f, g?, h, l*	H	*b.*
143. Yaxchilan, Str. 42, Lin. 42, 43						×								H, ?	*b, i.*
144. Yaxchilan, Str. 23, Lin. 26	?		(?)				(?)								
145. Yaxchilan, Str. 20, Lin. 13, 14						×								I	*b?, d.*
146. Yaxchilan, Str. 54, Lin. 54, 58						×								I, ?	*b?, i.*
147. Yaxchilan, Str. 54, Lin. 54, 58														B, R?	*a, b, q?.*
148. Yaxchilan, Str. 33, Lin. 1, 2						×								H. I	*b, i.*
149. Yaxchilan, Str. 33, Lin. 2, 3														H	*b, i.*
150. Yaxchilan, Str. 33, Lin. 3														I	*b.*
151. Yaxchilan, Str. 33, Lin. 1							?							H?	*b, i, p, q?.*
152. Yaxchilan, Stela 7					×					(?)		C		B?, H?	*b?, f, k, p, q?, t.*
153. Yaxchilan, Str. 55, Lin. 52, 53						×								N, ?	*p?.*
154. Yaxchilan, Str. 55, Lin. 53														F	*b, f, i?, p?.*
155. Yaxchilan, Stela 4	0	?												H	*b, g.*
156. Yaxchilan, Stela 20			(?)				(?)								
201. Chama							×							H	*b, f, m?, p, q.*
202. Chama														I	*d.*
203. Chama			(?)				(?)							?	*b.*
204. Chama														J	*d.*
205. Chama			×				×							(A, H)	*a?, b, f, q.*
206. Chama			×											H, I?	*b, i, q, t.*
207. Chama			?									B		H?	*b, i?, p?.*
208. Chajcar							(?)					?	*f, g, h, l, m*	D, ?	*a, b, c?, h?, j, t.*
209. Chajcar											×			?	*b.*
210. Copan			(?)				(?)								
211. Kaminaljuyu							×							M?, N	*f, q?.*
212. Kaminaljuyu														?	*n?, u?.*
213. Nebaj											×			B?	*a, d?, m, n.*
214. Rio Hondo							(?)				×			Q	*d.*
215. Rio Hondo							×							N, ?	*d, f.*
216. San Agustin Acasaguastlan														?	*d, l, v.*
217. San Agustin Acasaguastlan			?											I?, ?	*d.*
217a. "San Agustin Acasaguastlan"											?			?	*d, o.*
217b. "San Agustin Acasaguastlan"														F	*b, i, v.*
217c. Uaxactum			(?)				(?)							H	*b, f, g?*
217d. Yalloch														H	*b, i, g.*
218. Yucatan				×		×								K?, L	*d, v.*

TABLE 1.—*Symbolic associations, artistic features, and miscellany (individual representations)*—Continued

Entry	Anatomical source							Stem connects heads	Head set against plant	Figures amidst plant	Fish eats flower	Panel type	Leaf elements	Flower type	Flower elements
	Hands, arms	Neck	Ear	Nose	Eyes	Mouth	Head								
219. Yucatan										×		E, F	*b, g?, j*	A, G	*a, b, f, i?, q, t.*
220. Yucatan		(?)	(?)			(?)	(?)							?	*d?, f, u?.*
221. Yucatan	×	?												B	*a, (b, c), f?, g, m.*
222. Yucatan			×				×			0		B?		D?	*a, b, f, h, k?, m.*
301. Dresden 65a	×												*a, c?, g?, j*	H	*b, f, i, q.*
302. Dresden 67b	×													L	*d.*
303. Dresden 29c	×														
304. Dresden 44c	×											E			
305. Dresden 67a	×									×		E			
306. Dresden 15b	?													N, Q	*d, f.*
307. Dresden 48a, 49a	?													H, ?	*b, v?.*
308. Dresden 38b	×					×									
309. Dresden 8a			(?)				(?)							H	*c, h?, q.*
310. Dresden 13a													*b, g, h, j, m?*	Q	*d, u?.*
311. Dresden 25c														H	*c, q.*
312. Dresden 7c														H?	*(b, c), i.*
312a. Dresden 56														H	*b, i, o, q.*
312b. Dresden 50														H	*b, h.*
313. Madrid 10c										×		E			
314. Madrid 29a		?										E		(H, K), O?	*d, f, p?.*
315. Madrid 65b	?						×							(H, I)	*(b, c), f, i.*
316 Madrid 70b				×										(H, I)	*(b, c), f, i.*
317. Perez 22										×		E			

TABLE 2.—*Artistic elements of the water-lily leaf (site totals)*

Site	Positive and possible occurrences	Leaf elements												
		a	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*i*	*j*	*k*	*l*	*m*
Bonampak	(X)						2		2				1	
	(?)							2						
Calakmul	(X)				1		1		1	1	1			
	(?)							1						
Chichen Itza	(X)	2	1			2	3	2	1		4	1		
	(?)						1	3						
Copan	(X)		2				2	2	2			2		
	(?)													
Ixkun	(X)		1						1			1		
	(?)						1							
La Amelia	(X)						1	1	1				1	
	(?)													
La Mar	(X)		3				3		3			3		
	(?)							2						
Palenque	(X)	5	2	5	1		12	5	6	1	5		2	4
	(?)							4				1		1
Paraiso	(X)	1		1			1				1			
	(?)							1						
Piedras Negras	(X)						2	2					2	
	(?)													
Quirigua	(X)	1	1	1			4	3	2		2		2	1
	(?)							1						
Santa Rita	(X)		1	1							1			
	(?)							1						
Tulum	(X)		1				1			4	1		3	2
	(?)						2	5			1		1	
Yaxchilan	(X)						1		1				1	
	(?)							1						
Dresden Codex	(X)	1	1					1	1		2			
	(?)			1				1						
Ceramics	(X)		1				2	2	2		1		2	1
	(?)							1						
Total	(X)	10	14	8	2	2	35	18	23	6	18	7	14	8
	(?)			1			4	23			1	1	1	1

TABLE 3.—*Artistic flower types (site totals)*

Site	Positive and possible occurrences	Group I					Group II				Group III			Group IV				Group V		?
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	
Bonampak	(X)	2	1						1	9										3
	(?)	4	3				1		3	1		1								
Calakmul	(X)	1																		
	(?)																			
Cancuen	(X)							2												
	(?)																			
Chichen Itza	(X)	26	4	13	1		1		1	21	31	10	5		10	8	1	5	3	27
	(?)	1	2	3	1	1	1		1					1		3		2		
Chinkultic	(X)			1											1					
	(?)																			
Copan	(X)				2	9	1		3	6				6	1					2
	(?)								1						1					
"Cozumel" (Chilib ?)	(X)	1																		
	(?)																			
El Chicozapote	(X)																			2
	(?)								1											
Etzna	(X)																			
	(?)														1					
Ixkun	(X)	1	1																	1
	(?)									1										
La Amelia	(X)																			
	(?)					1														
La Honradez	(X)																			
	(?)									1										
La Mar	(X)		1		1															1
	(?)																			
Naranjo	(X)																			
	(?)														1					

TABLE 3.—*Artistic flower types (site totals)*—Continued

Site	Positive and possible occurrences	Group I					Group II				Group III			Group IV				Group V		?
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	
Palenque	(×)	4	---	---	---	---	---	---	31	10	---	---	---	9	1	---	---	---	---	7
	(?)	4	---	1	4	---	1	---	1	2	---	---	---	---	2	---	---	1	---	---
Paraiso	(×)	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	(?)	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Piedras Negras	(×)	---	---	---	---	---	2	---	5	---	---	---	---	---	---	---	---	---	---	3
	(?)	1	---	---	---	---	---	---	3	---	---	---	---	1	---	---	---	---	---	---
Quirigua	(×)	---	---	---	---	---	4	1	5	---	---	---	---	---	---	---	---	---	---	7
	(?)	---	---	---	---	3	2	---	5	---	---	---	---	1	---	---	---	---	---	---
Santa Rita	(×)	---	---	---	---	---	---	---	1	5	---	---	---	---	1	---	1	---	1	---
	(?)	---	---	---	---	---	---	---	2	3	---	---	---	---	---	---	---	---	---	---
Santa Rosa Xtampak	(×)	---	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---
	(?)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Sayil	(×)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	2
	(?)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Seibal	(×)	---	---	---	---	---	---	1	---	3	---	---	---	---	---	---	---	---	---	---
	(?)	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Tikal	(×)	---	---	---	---	---	---	---	1	---	---	---	---	---	2	---	---	---	---	2
	(?)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Tulum	(×)	---	---	---	---	---	---	---	2	9	---	9	---	---	---	---	32	10	4	---
	(?)	---	---	---	---	---	---	---	1	1	---	1	---	---	---	---	---	---	---	?
Uxul	(×)	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---
	(?)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Xcalumkin	(×)	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	(?)	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Xcocha	(×)	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	(?)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Xculoc	(×)	4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	(?)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Xultun	(×)	---	---	---	---	---	---	---	---	---	---	---	---	1	1	---	---	2	---	3
	(?)	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Yaxchilan	(×)	---	1	---	---	---	1	---	8	8	---	---	---	---	1	---	---	---	---	3
	(?)	---	3	---	---	---	---	---	4	---	---	---	---	---	---	---	---	---	1	---
Alta Verapaz (ceramics)	(×)	---	---	---	1	---	---	---	2	1	6	---	---	---	---	---	---	---	---	6
	(?)	6	1	---	---	---	---	---	8	1	---	---	---	---	---	---	---	---	---	---
Yucatan (ceramics)	(×)	1	1	---	---	---	---	---	1	---	---	---	1	---	---	---	---	---	---	1
	(?)	---	---	---	2	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---
Miscellaneous (ceramics)	(×)	---	---	---	---	---	1	---	2	1	---	---	---	---	5	---	---	2	---	10
	(?)	---	---	---	---	---	---	---	---	1	---	---	---	1	---	---	---	---	---	---
Dresden Codex	(×)	---	---	---	---	---	---	---	12	---	---	---	1	---	3	---	---	2	---	1
	(?)	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---
Madrid Codex	(×)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	(?)	---	---	---	---	---	---	---	4	3	---	1	---	---	---	1	---	---	---	---
Perez Codex	(×)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	(?)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Total sculptures and murals	(×)	41	9	14	4	9	9	4	59	71	31	20	5	16	18	8	34	17	8	63
	(?)	10	9	4	5	8	5	---	22	9	---	2	---	3	5	3	---	3	1	---
Total ceramics	(×)	1	1	---	1	---	1	---	5	2	6	---	1	---	5	---	---	2	---	17
	(?)	6	1	---	2	---	---	---	8	2	---	1	---	1	---	---	---	---	---	---
Total codices	(×)	---	---	---	---	---	---	---	12	---	---	---	1	---	3	---	---	2	---	1
	(?)	---	---	---	---	---	---	---	5	3	---	1	---	---	---	1	---	---	---	---

TABLE 4.—*Artistic flower elements (site totals)*

Site	Positive and possible occurrences	Flower elements																					
		a	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*i*	*j*	*k*	*l*	*m*	*n*	*o*	*p*	*q*	*r*	*s*	*t*	*u*	*v*
Bonampak	(×)	4	3	5					1	5									1		1	1	
	(?)	4	9	10					1	2													
Calakmul	(×)	1		1																			
	(?)									1													1
Cancuen	(×)		1																				
	(?)		1																		1		
Chichen Itza	(×)	52	39	13	107		7	5	4		10	1	9	4	4	5	2	9	5	2	34	2	14
	(?)	2	9	1		1	7		3			2	1	7	6	3	6			3	6	1	
Chinkultic	(×)	1		1			1				1						1						
	(?)																						
Copan	(×)	11	2	2		9	11		7	3	4			2			6	9	1			5	
	(?)		17	8					3	3		3			4		4	2			1	2	
"Cozumel" (Chilib?)	(×)	1	1																				1
	(?)																						
El Chicozapote	(×)		2		1																		
	(?)	1																					
Etzna	(×)								1														
	(?)																						
Ixkun	(×)	2	2																				
	(?)		1	1				1	1														
La Amelia	(×)																						
	(?)	1	1																			1	
La Honradez	(×)		1							1													
	(?)																						
La Mar	(×)	2	2																1			2	
	(?)				1																1	1	
Naranjo	(×)								1														
	(?)																						
Palenque	(×)	13	33	6	4		12	3	2	7		7		2	5		26	40	3	5		5	
	(?)	1	10	6	2	1	1		23			6						3	4		4	1	4
Paraiso	(×)	2		1		1										1							
	(?)		1	1			1			1											2		
Piedras Negras	(×)		6				8			8								2					
	(?)	1	6	4														3		1			
Quirigua	(×)		5			1	4	5	2	4							1	4	4			2	
	(?)	1	4		1	1	1	1	2	3	1	1					3	2				1	6
Santa Rita	(×)		2				2		1							3		5					
	(?)		6	6			1		3			1				3							
Santa Rosa Xtampak	(×)				1											1							
	(?)										1												
Sayil	(×)																						
	(?)															2							

TABLE 4.—*Artistic flower elements (site totals)*—Continued

Site	Positive and possible occurrences	Flower elements																					
		a	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*i*	*j*	*k*	*l*	*m*	*n*	*o*	*p*	*q*	*r*	*s*	*t*	*u*	*v*
Seibal	(X)		1				1			1							2		2				
	(?)	1	3	3										1									
Tikal	(X)		1				4		2	2											1		
	(?)		2															1			1		
Tulum	(X)		1	1	21		1				1					9	3	6					
	(?)		9	9					9	2							32		7				
Uxul	(X)		1				1			1													
	(?)																						
Xcalumkin	(X)	2	1											1									2
	(?)																						
Xcocha	(X)	1	1				1																1
	(?)											1											
Xculoc	(X)	4		4																			4
	(?)																						
Xultun	(X)	1	1		2					1	1							1					
	(?)		1																		1	1	
Yaxchilan	(X)	3	12		2		2			6		1					3	2			2		
	(?)		10				1			1							2	4					
Alta Verapaz (ceramics)	(X)	3	16		6		8			1	1						2	9			2		
	(?)	7	1	1	1				1	1				3			1						
Yucatan (ceramics)	(X)	4	4		2		4	1	2					2				2			1		1
	(?)		1	1	1		1			1		1										1	
Miscellaneous (ceramics)	(X)		3		11		6			2						1		1					7
	(?)														2			2				2	
Dresden Codex	(X)		8	4	3		4		2	6						2		9					
	(?)		1	1					1													1	1
Madrid Codex	(X)				2		8			3													
	(?)		3	3													5						
Perez Codex	(X)																						
	(?)																						
Total sculptures and murals	(X)	100	118	34	138	11	55	13	21	39	17	9	9	9	9	19	44	78	17	7	38	17	22
	(?)	12	90	49	4	3	12	2	45	13	2	14	1	8	10	8	47	15	11	4	17	7	11
Total ceramics	(X)	7	23		19		18	1	2	3	1			2		1	2	12			3		8
	(?)	7	2	2	2		1		1	2		1		3	2		1	2				3	
Total codices	(X)		8	4	5		12		2	9						2		9					
	(?)		4	4					1								5					1	1

TABLE 5.—*Symbolic associations and over-all types (site totals)*

Site	Positive and possible occurrences	Number of monuments	Number of monuments: Probability A	Number of representations	Number of representations: Probability A	Type												Glyph	Death symbols	Human headdress	Nonhuman headdress	Association of plant								Anatomical source							Stem connects heads	Head set against plant	Figures amidst plant	Fish eats flower
						Ia	Ib	IIa	IIb	IIc	IId	IIe	IIf	II-?	IIIa	IIIb	IV					Mask panel: Full face	Mask panel: Profile	Long-nosed God (body)	Serpent Head X, &c	Wing Panel	Serpent Bird	Bird	Jaguar	Hands, arms	Neck	Ear	Nose	Eyes	Mouth	Head				
Bonampak	(X)	2	2	19	14	4	8			1					7				1	15	2	1	3		11			1				6				5				9
	(?)					6				7					1						7					1				1		1				8				
Calakmul	(X)	1	1	1	1					1										1																				1
	(?)	1		1																1																				1
Cancuen	(X)	2	1	2	1	1								1						1		1						1												
	(?)																																							
Chichen Itza	(X)	7	4	47	24	2	3	18	2	2		2		18					4	6	2	5	2		4			3		3	1	5		4	1	4		2	24	5
	(?)																		1	4	2	3													20	7			3	
Chinkultic	(X)	2	1	2	1		2													2																				
	(?)																		1											1								1		
Copan	(X)	13	7	26	12	6	10			2	2				2	2		3	5	9	8	1	2		6	2	1		3	3	3	1		2	3		2		2	5
	(?)						1					1						2	2	2		1			2				1	1	1	3			3	4		1		
"Cozumel" (Chilib?)	(X)	1		1			1																																	
	(?)																			1																1				
El Chicozapote	(X)	1		1		1																																		
	(?)																																							
Etzna	(X)	1		1		1																																		
	(?)																																							
Ixkun	(X)	2	1	4	2					1										4	3				3															2
	(?)						1			2																1									1					
La Amelia	(X)	1	1	1	1					1										1																				
	(?)																																							
La Honradez	(X)	1		2			1								1					2									1											
	(?)																															1				1				
La Mar	(X)	1	1	4	4					4										4	4				4															
	(?)																																							
Naranjo	(X)	2	1	2	1	1																	1																	
	(?)													1		1									1															
Palenque	(X)	13	9	44	20	10	14	2	1	3		3	2		3	3	2	3	3	19	4	5		4	6	4	1		4	3	1	1			1	5		2	2	7
	(?)						1												2		4	1	2									5			4	6				
Paraiso	(X)	1	1	2	2				1		1								1																			1		
	(?)																															1						1		1

TABLE 5.—*Symbolic associations and over-all types (site totals)*—Continued

Site	Positive and possible occurrences	Number of monuments	Number of monuments: Probability A	Number of representations	Number of representations: Probability A	Type												Glyph	Death symbols	Human headdress	Nonhuman headdress	Association of plant								Anatomical source							Stem connects heads	Head set against plant	Figures amidst plant	Fish eats flower
						Ia	Ib	IIa	IIb	IIc	IId	IIe	IIf	II-?	IIIa	IIIb	IV					Mask panel: Full face	Mask panel: Profile	Long-nosed God (body)	Serpent Head X, &c	Wing Panel	Serpent Bird	Bird	Jaguar	Hands, arms	Neck	Ear	Nose	Eyes	Mouth	Head				
Piedras Negras	(×)	11	3	14	3	4	4		1						1	3				9	1	3					3	1	2				1		2	1				
	(?)						1								1							1							3			6	2			6				
Quirigua	(×)	7	6	22	13	4	6	3		2				1			2	8	7	2	6	2		3	7	3	1	2		3	4	2	1		4		3	3	2	
	(?)						3	3											3		4	1					1		1		1	1			2	4				1
Santa Rita	(×)	1	1	5	1		3									1																								
	(?)					1													3											3		1	1							
Santa Rosa Xtampak	(×)	1		1																1													1							
	(?)						1																					1												
Sayil	(×)	1	1	1	1														1			1								1				1						
	(?)							1			1																													
Seibal	(×)	2	1	3	1		1													1																				1
	(?)						2																																	
Tikal	(×)	3		5			2												2										3						2	1				
	(?)						3																		2							3				2				
Tulum	(×)	1	1	14	3		7		7																1					1			4			1				
	(?)																													2										
Uxul	(×)	1		1			1													1																				
	(?)																																							
Xcalumkin	(×)	2		2		1	1													2																				
	(?)																																							
Xcocha	(×)	1	1	1	1															1																				
	(?)						1																																	
Xculoc	(×)	1	1	2	2	2																																		
	(?)																																							
Xultun	(×)	4	2	5	2	2	3								1														5						3					
	(?)	2		2			5								1														2	5		4			2	4				
Yaxchilan	(×)	12	2	30	2	6		1		1					4					25	1		1		2	14			3					1	14					1
	(?)					1	17														5				5				1	1	1	4				5			1	
Alta Verapaz (ceramics)	(×)	8	7	16	14	3	6	1				1							1	6	4		4		5			1	2			3				3				4
	(?)						3			2		2			1				2		2											2				3				
Yucatan (ceramics)	(×)	4	3	5	3	1	1				1								1				2		2				1	1		1	1		1	1			1	
	(?)						2	1	1												1				1				1		2	1			1	1				

Miscellaneous (ceramics)	(×)	9	2	21	5	6	13	---	---	---	---	---	---	---	1	---	---	---	8	3	8
	(?)	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	4
Dresden Codex	(×)	1	1	13	7	4	2	---	1	1	---	---	---	---	2	---	---	---	---	1	3
	(?)	---	---	---	---	---	2	2	---	---	1	---	---	---	---	2	---	1	---	---	---
Madrid Codex	(×)	1	---	4	---	---	2	---	---	---	---	---	---	1	---	1	---	---	1	1	---
	(?)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Perez Codex	(×)	1	---	1	---	---	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---
	(?)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Total sculptures and murals	(×)	102	49	268	112	45	67	24	12	18	3	5	2	20	19	9	4	14	24	106	31
	(?)	---	---	---	---	8	36	4	---	9	1	1	---	1	3	1	---	2	12	8	22
Total ceramics	(×)	21	12	42	22	10	20	1	---	---	1	1	---	---	1	---	---	---	10	9	12
	(?)	---	---	---	---	---	5	1	1	2	1	2	---	---	1	---	---	---	2	---	7
Total codices	(×)	3	1	18	7	4	4	---	1	1	---	---	---	1	2	2	---	---	1	2	3
	(?)	---	---	---	---	---	2	2	---	---	1	---	---	---	---	2	---	1	---	---	---

Miscellaneous (ceramics)	(×)	---	6	---	8	---	---	6	1	---	---	---	---	---	---	3	---	---	---	4
	(?)	---	---	---	---	---	---	2	1	---	---	3	---	---	---	6	---	---	---	1
Dresden Codex	(×)	---	---	8	---	---	---	2	1	6	---	---	---	---	1	---	---	---	1	---
	(?)	---	---	---	---	---	---	---	---	3	---	1	---	---	---	1	---	---	---	---
Madrid Codex	(×)	---	---	---	1	---	---	---	---	---	---	---	1	---	---	1	---	---	1	---
	(?)	---	---	1	---	---	---	---	---	1	1	---	---	---	---	---	---	---	---	---
Perez Codex	(×)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	---
	(?)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Total sculptures and murals	(×)	19	9	7	44	23	6	8	21	14	9	15	7	8	30	17	5	8	30	31
	(?)	7	2	---	10	2	1	1	8	14	3	30	3	---	32	48	---	3	4	3
Total ceramics	(×)	---	12	---	15	---	---	7	4	1	---	4	1	---	1	7	---	---	1	8
	(?)	---	---	---	2	---	---	2	2	---	2	6	---	---	1	10	---	---	---	1
Total codices	(×)	---	---	8	1	---	---	2	1	6	---	---	1	---	1	1	---	---	3	--
	(?)	---	---	1	---	---	---	---	---	4	1	1	---	---	---	1	---	---	---	--

TABLE 6.—*Symbolic associations and over-all types (chronological totals)*

SCULPTURES AND MURALS

Period	Positive and possible occurrences	Number of sites	Number of sites: Probability A	Number of monuments	Number of monuments: Probability A	Type												Glyph	Death symbols	Human headdress	Nonhuman headdress	Association of plant								Anatomical source							Stem connects heads	Head set against plant	Figures amidst plant	Fish eats flower
						Ia	Ib	IIa	IIb	IIc	IId	IIe	IIf	II-?	IIIa	IIIb	IV					Mask panel: Full face	Mask panel: Profile	Long-nosed God (body)	Serpent Head X, &c	Wing Panel	Serpent Bird	Bird	Jaguar	Hands, arms	Neck	Ear	Nose	Eyes	Mouth	Head				
Late Yucatan variants, Toltec	(X)	7	6	13	9	2	5	4	2	1	---	1	---	4	---	1	---	---	4	4	1	2	1	---	3	---	---	1	---	4	1	2	1	3	1	2	---	1	6	1
	(?)	---	---	---	---	1	1	1	---	---	1	---	---	---	---	---	---	---	1	2	1	2	---	---	---	---	---	---	---	1	---	1	1	---	2	3	---	---	---	---
Late Classic	(X)	7	3	13	7	3	2	2	2	1	1	1	---	---	2	1	1	---	2	5	1	1	---	2	---	---	1	---	3	2	---	1	1	---	2	1	---	1	1	1
	(?)	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	1	2	---	3	---	---	---	2	---	---	---	1
10.3	(X)	1	1	1	1	---	1	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---	1	---	---	---	---	---
	(?)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	---	1	---	---	---	1	---	---	---	---
10.1	(X)	2	1	3	1	---	2	---	---	---	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	1	---	---	---	---	---	1	---	---	---	---	1
	(?)	---	---	---	---	---	1	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	---	1	---	---	1	1	---	---	---	---
10.0. (?)	(X)	2	1	2	1	---	---	---	---	1	---	---	---	---	---	---	---	---	---	2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---
	(?)	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
9.19. (?)	(X)	1	---	1	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	1	1	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	(?)	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	1	---	---	---	---	---
9.18	(X)	4	2	4	2	2	---	---	---	1	---	---	---	---	---	---	---	---	---	3	2	---	---	---	2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1
	(?)	---	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
9.18. (?)	(X)	4	2	5	2	1	2	1	---	---	---	---	---	1	2	---	1	---	1	3	---	2	---	1	1	1	---	1	2	1	1	1	---	---	---	---	---	1	---	---
	(?)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	1	1	---	2	---	---	2	3	---	---	---	---
9.17	(X)	2	1	4	3	1	4	2	---	---	---	---	---	---	---	---	---	1	2	2	1	---	---	---	3	2	1	1	---	2	2	---	1	---	2	---	2	1	2	---
	(?)	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---	---	1	1	---	---	---	---	1	---	2	---	---	1	---	---	1	2	---	---	---	---
9.17. (?)	(X)	4	4	9	7	2	7	---	---	1	---	---	---	---	1	---	---	---	2	3	5	1	1	---	2	---	---	1	1	---	---	1	---	---	---	1	---	---	---	3
	(?)	---	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	1	---	---	---	3	1	2	---	---	---	1	---	---	---	---
9.16	(X)	5	2	9	4	4	3	---	---	2	---	---	---	1	---	---	---	1	3	4	3	1	1	1	2	1	---	1	1	---	---	2	---	---	2	---	1	---	---	1
	(?)	---	---	---	---	---	4	---	---	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3	---	---	---	1
9.16. (?)	(X)	2	2	7	3	1	1	---	---	1	---	1	1	---	1	1	---	---	1	6	1	1	---	---	2	3	1	1	1	---	1	---	1	---	4	1	---	1	---	1
	(?)	---	---	---	---	1	5	---	---	---	---	---	---	---	---	---	---	---	---	---	3	1	1	---	1	---	---	---	---	---	---	3	---	---	---	2	---	---	---	---
9.15	(X)	3	2	6	2	1	1	---	---	1	---	---	---	---	2	2	---	---	1	3	---	1	1	---	1	---	1	---	1	1	1	---	---	1	1	---	1	---	1	1
	(?)	---	---	---	---	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	1	---	---	---	1	---	---	1	1	---	1	1	---	---	---	---

9.15. (?)	(X)	3	1	5	1	2	1	1	---	---	---	---	---	---	---	1	---	1	---	1	1	---	---	1	1	---	1	---	---	1	---	---	---	1	---	---	---	1	1	---
	(?)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	1
9.14. (?)	(X)	2	2	4	3	4	2	---	1	---	---	---	---	---	2	---	---	---	1	4	1	2	---	1	---	2	---	---	2	---	---	---	---	---	1	1	---	---	---	2
	(?)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	---	---	1	---	---	---	---	---	---	---	---	---	2	---	---	2	2	---	---	---	---
9.13	(X)	1	---	1	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---
	(?)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	---	---	---	1	---	---	---	---
9.13. (?)	(X)	1	1	1	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	(?)	---	---	---	---	---	---	---	---	---	---	---	---	1	---	1	---	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
9.12	(X)	2	---	3	---	1	1	---	---	---	---	---	---	---	---	1	---	1	---	1	---	1	---	---	---	---	1	---	1	---	---	---	---	---	1	---	---	---	---	---
	(?)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	1	---	---	1	---	---	---	---
9.12. (?)	(X)	3	1	4	2	1	2	---	---	1	---	1	---	---	---	1	1	1	---	2	1	1	---	---	2	---	---	---	2	---	---	---	---	---	---	1	---	---	---	---
	(?)	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---	---	2	---	---	---	2	---	---	---	---
9.11. (?)	(X)	1	---	1	---	---	1	---	---	---	1	---	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	(?)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
9.10. (?)	(X)	2	1	2	1	1	---	---	---	---	---	---	---	---	---	---	---	---	---	2	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	(?)	---	---	---	---	---	1	---	---	---	---	1	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---	---	2	---	---	1	---	---	1	2	---	1	---	---
9.7. (?)	(X)	1	---	1	---	---	1	---	---	---	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	(?)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	1	---	---
9.6	(X)	1	---	1	---	---	1	---	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---
	(?)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	---	---	---	1	---	---	---	---
9.4	(X)	1	---	1	---	---	---	---	---	---	---	---	---	---	1	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	(?)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	---	---	1	---	---	---	1	---	---	---	---
9.0. (?)	(X)	1	---	1	---	---	1	---	---	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---
	(?)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

SOURCES OF ENTRIES (TABLE 1)[9]

SCULPTURES AND MURALS

1–12. Bonampak, Palace 1, Room 1. Villagra Caleti; copy by Antonio Tejeda.
13–14. Bonampak, Stela 2. Proskouriakoff, fig. 69*a*.
15. Calakmul, Stela 54. Ruppert and Denison, fig. 51*c*.
16. Calakmul, Stela 53. Ruppert and Denison, fig. 51*b*.
17. Cancuen, Altar 1. Morley, 1937–38, vol. 5, pl. 96*b*.
18. Cancuen, Stela 1. Maler, 1908a, pl. 13, No. 1.
19–20. Chichen Itza, Temple of the Tigers, Chamber A. Maudslay, vol. 3, pl. 35*a*, *b*.
21. Chichen Itza, Temple of the Tigers, Chamber A, Inner (Painted) Chamber. Seler, vol. 5, p. 325; copy by Adela C. Breton.
22. Chichen Itza, Tigers, Chamber E (Lower Temple). Maudslay, vol. 3, pl. 43*c*, *d*, vol. 4, pl. 93*o*.
23. Chichen Itza, Tigers, Chamber E. Maudslay, vol. 3, pl. 51*e*, *f*.
24. Chichen Itza, Tigers, Chamber E. Maudslay, vol. 3, pl. 45 (Nos. 1–6).
25. Chichen Itza, Temple of the Tigers, Chamber E (Lower Temple). Maudslay, vol. 3, pls. 46 (Nos. 7–10), 47 (Nos. 15–18).
26. Chichen Itza, Temple of the Tigers, Chamber E (Lower Temple). Maudslay, vol. 3, pls. 46–47, (Nos. 11–14).
27. Chichen Itza, Temple of the Tigers, Chamber E (Lower Temple). Maudslay, vol. 3, pl. 48.
28. Chichen Itza, Temple of the Tigers, Chamber E (Lower Temple). Maudslay, vol. 3, pls. 44*B*, 49*B* (No. 13).
29. Chichen Itza, Temple of the Tigers, Chamber E (Lower Temple). Maudslay, vol. 3, pls 46*A* (No. 7), 47*A* (No. 14).
30. Chichen Itza, Chamber C (North Building, Ball Court). Breton, fig. 7.
31. Chichen Itza, Chamber C (North Building, Ball Court). Breton, figs. 5, 6.
32. Chichen Itza, Chamber C (North Building, Ball Court). Breton, pl. 4.
33. Chichen Itza, Chamber C (North Building, Ball Court). Breton, fig. 7, pl. 4.
34. Chichen Itza, Chamber C (North Building, Ball Court). Breton, fig. 3.
35. Chichen Itza, Ball Court, Benches. Palacios, 1937 a, fig. 41.
36. Chichen Itza, Temple of the Chac Mool. Morris, Charlot and Morris, vol. 2, pl. 28*A*–*B*.
37. Chichen Itza, Temple of the Chac Mool, Columns 1–5. Morris, Charlot and Morris, vol. 2, pls. 29–32, 35.
38. Chichen Itza, Temple of the Chac Mool, South Bench, Side A. Morris, Charlot and Morris, vol. 2, pl. 133 (No. 3, 5).
39. Chichen Itza, Temple of the Warriors, Columns 8, 9. Morris, Charlot and Morris, vol. 2, pls. 48*E*, 49*E*.
40. Chichen Itza, Northwest Colonnade, Column 51. Morris, Charlot and Morris, vol. 2, pl. 115*S*.
41. Chichen Itza, Northwest Colonnade, Dais. Morris, Charlot and Morris, vol. 2, pl. 129.
42. Chinkultic, Ball Court Marker. Orozco Muñoz, figs. 89, 90.
43. Chinkultic, Stela 7. Blom and La Farge, fig. 365.
44. Copan, Stela 9. Maudslay, vol. 1, pl. 110*c*.
45, 46. Copan Stela 2, Maudslay, vol. 1, pl. 101.
47. Copan, Second Ball Court, North and South Markers, Morley, 1937–38, vol. 2, End Piece, vol. 4, End Piece.

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[9] Where only one title appears for an author in the Literature Cited, this list omits the publication date.

48. Copan, Second Ball Court, Middle Marker. Morley, 1937–38, vol. 3, End Piece.
49. Copan, Altar K. Maudslay, vol. 1, pl. 73*a*, (glyph 17).
49a. Copan, Stela 6. Maudslay, vol. 1, pl. 105*a*.
49b. Copan, Stela A. Maudslay, vol. 1, pl. 26.
49c. Copan, Stela H. Maudslay, vol. 1, pls. 61, 99*b*.
50. Copan, Stela B. Maudslay, vol. 1, pl. 37*A*, *B*.
51. Copan, Stela B. Maudslay, vol. 1, pl. 37*B*.
52. Copan, Stela B. Maudslay, vol. 1, pl. 37*A*.
53. Copan, Stela N. Maudslay, vol. 1, pls. 77, 82.
54. Copan, Stela N. Maudslay, vol. 1, pl. 79*a*, *b*.
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The Medicine Bundles of the Florida Seminole and the Green Corn Dance

By LOUIS CAPRON

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THE MEDICINE BUNDLES OF THE FLORIDA SEMINOLE AND THE GREEN CORN DANCE

By Louis Capron

INTRODUCTION

At the 1950 census the Seminole of Florida numbered 823, the progeny of some 150 left in the Everglades and other remote parts of the southern peninsula at the end of their war with the United States (1835–42). There they were isolated for the next hundred years—a lost world of culture—cut off from surrounding influences by an understandable hate, suspicion, and mistrust. To a great extent their subsequent contacts with the Whites have done little to change this attitude.

This "Iron Curtain" not only preserved their culture virtually unaltered, it made that culture extremely difficult for the ethnologist to study. This difficulty was amply demonstrated by Clay MacCauley, who in 1880 made as comprehensive a study as possible for the Bureau of American Ethnology, and it is well illustrated by the fact that, to date, no eye-witness account of the Green Corn Dance has ever been published, nor has it been known that they possessed Medicine Bundles, much less that their social, political, and religious organization centered around them.

With the simple physical aspects of Seminole culture so difficult to come by, it is easy to see how almost impossible it is to penetrate to their esoteric life. Two things, at least, are absolutely essential. The first is a friendship and confidence that can be built up only over a period of years, and, secondly, some knowledge of what to look for and what it means. Time to establish the first has been lacking to the ethnologist. Those whom long friendship has admitted to some phases of the secret beliefs have lacked the background to interpret and evaluate them.

This is particularly true of the Medicine Bundles. The Medicine in them is no longer used for its curative properties, though this was the original function of much of it. The Bundles are brought out only for the Green Corn Dance, and then they are in evidence only from the morning of Court Day to sunrise the following morning—24 hours during which it is the almost invariable rule that no white man may be present.

Two other things are behind the Seminole secrecy regarding the Medicine. The first is the fear of harming it. There is no certainty as to just what an antagonistic presence might do to injure the Medicine—to draw its power or make it harmful instead of benign. So essential to their welfare do the Indians consider the Medicine that they take no chances. The final element is the fear of ridicule. The white man as a rule does not bother to hide his amusement and skepticism of rituals and beliefs that differ from his own.

These, then, are the reasons that the Medicine Bundles of the Florida Seminole have just come to light. They are also among the reasons why error may creep into a report on the Medicine, however careful one may be to keep it out. Add to this the fact that almost none of the older Seminole who know the lore talk good English or understand English well and combine this with the difficulty of expressing abstract ideas, and one has a further picture of the difficulty of obtaining esoteric data.

Basically, the facts here given are correct. The broad picture is authentic. On minor points there is often disagreement at the source, in some cases it may be from a misunderstanding of the question, in others there is an actual difference of opinion. There are naturally errors on the part of the transcriber. What this does pretend to be is a skeleton, articulated as carefully as possible, with flesh and skin added where practicable, but to be built up by future investigations into a completed whole. And this must be done soon. The younger generation cares little for ancestral lore and rituals, and soon the most authentic aboriginal ideologies still existing will have passed with the wise old men.

THE FLORIDA SEMINOLE

There are only 823 Seminole. They occupy the southern part of the Florida Peninsula, from a few miles north of Lake Okeechobee to a short distance south of the Tamiami Trail. They are naturally divided into two linguistic groups. From the beginning of the Seminole Nation, this division between Miccosuki and Creek has been recognized. The Cow Creeks speak a dialect of Creek; the Miccosuki, a Hitchiti dialect. How different they can be is shown by the two names for Florida's great, central lake. O-kee (water) Cho-bee (big) is Miccosuki. Wee (water) thloc-ko (big) is Cow Creek. Both of these names are recognized by the War Department map of 1838—the first map to show the lake correctly. In spite of intermarriage between the groups, this difference in language still persists.

The Cow Creeks, or Muskohegan proper, live to the north and northeast of Lake Okeechobee and number roughly a third of the whole population. Their territory includes the large Government reservation south of Brighton, which was laid out to embrace the traditional home of several families. The others are scattered on private lands where, in many cases, their families have lived for generations. They are usually located on or near ranches where they can find work with stock raisers or vegetable growers. Most of those on the reservation are employed there by the Government in maintenance work or with the Indian cattle herd. Those off the reservation are self-supporting.

The Miccosuki live south of Lake Okeechobee. Several families live on or near the Government reservation at Dania, where some of them have established commercial camps for the sale of coconut-fiber dolls, beadwork, Seminole clothing, and other handiwork. Most of the men find work of various kinds nearby. There are several commercial camps in Miami where the Indians are maintained and exploited by Whites. There are about 10 commercial camps along the Tamiami Trail, owned and operated by Indians. And finally, there are numerous families in the State reservation, on hammocks in the marshlands north of the Tamiami Trail, and all through Big Cypress Swamp.

MODE OF LIVING

Almost without exception, the Seminole live as they have lived for a hundred years. Each group is a family, consisting of the old couple, the married daughters and their families, and the unmarried sons and daughters. In the center is the communal cooking shelter with a thatched roof over the star fire. Around this are grouped the individual houses with thatched, overhanging roofs and a wooden floor about 2 feet above the ground.

They do buy groceries from the Whites and make their bread of white flour instead of the traditional koonti root. But in the main the only concessions they make to the inventions of the last hundred years are the automobile, the phonograph, and the hand Singer sewing machine with which the women put together the intricate piecework of their garments.

This resistance to change marks the rituals and recondite matters to an even greater degree. Changes do occur but they are natural changes, such as happen when there are no written records, or they are a normal development from year to year. None are concessions to the white society with which they are surrounded. Their ceremonies are in no way for show nor do they cater to an alien audience. In fact, they want no audience. The rituals are sincere and sacred and still serve their original purposes.

THE MEDICINE BUNDLES

The religious and political life of the Seminole centers around three Medicine Bundles (sook-cha, "bag"—mic-co, "chief"; or hil·leesh·wa, "medicine"—a-sook-cha, "bag" (Cow Creek); ai-yicks-chee, "medicine"—sa-bo-kee, "bag"; or ai-yicks-chee, "medicine"—chin-a-box-shee-kee, "morning" (Miccosuki)). Each is kept by a Medicine Man (hil-leesh-wa, "medicine"—puts-cha-shee, "looks after" (Cow Creek); ai-yicks, "medicine"—me-for-see, "takes care of" (Miccosuki). Thus the Seminole are divided into three groups, each of which has a Medicine Bundle, a Medicine Man with one or more assistants, a senate of three or four older men who govern the group, each of which has its own Green Corn Dance.

Sam Jones is the Medicine Man of the Cow Creek Seminole. He got his Bundle from his father-in-law, Billy Smith. His principal assistant is his brother, Frank Shore, who is expected to succeed him as Medicine Man.[1] Oscar Hoe, another brother, was previously his principal assistant.

Ingraham Billy is Medicine Man of the Tamiami Trail Miccosuki. This Bundle was held for a great many years by Billy Motloe. When he died it passed to Ingraham's brother, Josie Billy. A few years ago, Josie was converted to the Christian faith. He gave up his position as Medicine Man, but went on using his knowledge of herbs as an Indian doctor. For two years he held his Medicine Bundle, during which time there was no Green Corn Dance on the Trail. Then he turned it over to Ingraham Billy, who already had a name as a Medicine Man, and who put on his first Green Corn Dance in 1948. His assistants are his son, Jimmy Billy, and Frank Charlie.

The Big Cypress Medicine Bundle is held by Frank Tucker, but he has had it only a few months. It was given to him by his father-in-law, John Osceola, who put on the Corn Dance in 1949 with Frank Tucker as one of his assistants. For many years this Bundle was held by Cuffney Tiger, who put on the Corn Dance of the Big Cypress group. He died at the Cow Creek Green Corn Dance in 1947. His Medicine Bundle disappeared for 2 years. Ingraham Billy, Trail Medicine Man, had hidden it until he could find someone he thought capable of handling it. He finally turned it over to John Osceola, whose assistants at the 1949 Corn Dance were his sons-in-law, Frank Tucker and John Billy, and his son, Billy Osceola.

It is not planned that the Medicine Bundle be passed on by death. The Medicine Man's assistant is trained to succeed him, and when he feels his successor is ready, the Medicine Man turns the Bundle over to him and retires to private life. Sam Jones, by far the senior of the present Medicine Men, is turning over more and more of his part in the ritual of the Green Corn Dance to Frank Shore, and hopes soon to transfer the whole thing.[2] He has been Medicine Man for over 20 years.

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[1] Sam Jones has retired, and Frank Shore is now Medicine Man.

THE MEDICINE

The Medicine Bundle is to the Seminole what the Ark of the Covenant was to the Jewish Nation. The Medicine was given to him directly by God, and the Bundle contains everything necessary for the Indian's well-being. When new conditions arise and something is needed to control them for the Indian's benefit, es-te fas-ta reaches down sometime during the last night of the Green Corn Dance and places in the deerskin that holds the Medicine a new kind to meet the new need.

If the Seminole group is the "body," then the council of old men is the "brain," and the Medicine Bundle, which is the concrete symbol of God's care for the Indian, is the "soul." The Medicine is alive. Each piece of it must move by itself some time the last night of the Green Corn Dance. It has the power to do great good. That was the purpose for which God intended it. But if misused, it has the power to do great harm. That is why it is guarded so carefully—lest its forces be changed in some way into forces of evil; lest its powers be turned down a wrong channel and become hurtful instead of helpful. And that is why the first thing the Medicine Man does each morning of the Green Corn Dance, as he stands naked in the pond facing the east, is to rub the water over his body as he prays that he may handle the Medicine safely and for the good of the Indian, and that it may do him no harm.

This is the song of the Medicine Man as he stands in the water facing the sunrise, the last 4 days of the Green Corn Dance:

Supa-hon-sup-h (Repeated six times)
Ta-lok-ka-lee
Staf-a-sta
Fil-sa-hon (Repeated six times)
Ta-lok-a-lee (Repeated four times)

Translation

Fog Make bright Bless
Now they come Please give me something
Don't say, "No" Bless
Now they come Please give me something

The fact that the Medicine Bundle is the "soul" of the group is perhaps best demonstrated by the fact that if the Medicine is allowed to die, as it can through several years of discontinuance of the Green Corn Dance, the life would pass out of the tribe—"No more Seminole," it was explained. "Mebbe Indian die." I read that passage to Sam Jones, Medicine Man of the Cow Creek Seminole. "No more White man," he amended. "Everything gone!"

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[2] He has now done so.

One cannot help being struck by the truth in Indian symbolism. If the Green Corn Dance were neglected, the Medicine would die, because it would mean that faith in the Medicine was dead. Faith is the life of any religion, just as faith is an essential element in the cure of disease. It is also obvious that if the great cohesive force of the Green Corn Dance were lacking, the tribe would disintegrate.

The Medicine is always folded in a deerskin, hair side out. When the medicine has to be hidden out at the time of the Green Corn Dance, it is further wrapped in a piece of waterproof cloth if the weather is inclement. Within the outer covering, each kind of medicine is done up in a small piece of buckskin, and wound with a buckskin thong. The private medicine of certain of the Indians is usually wrapped in cloth. The Medicine consists of many different things: pieces of horn, feathers, stones, dried animal parts—some six or seven hundred different items in each Medicine Bundle—but the identical things in each of the three bundles. Where the Medicine came from originally is shown in the story of the Rattlesnake and the Horned Owl. This is as it was told to me by Sam Tommie in 1938, and checked since with two Medicine Men:

THE RATTLESNAKE AND THE HORNED OWL

Long time ago, Rattlesnake think he see how long he go without eat. Horned Owl he come along. He say, "What you do?"

Rattlesnake say, "I see how long I go without eat."

Owl he say he can go longer without eat than Rattlesnake.

So that Rattlesnake say, "All right. I know I can go longer without eat than you can. You go up in that tree. Don't you go away. Every 30 days I come out. I rattle. You holler, 'Ow!' "

So that Rattlesnake go in he's hole. Thirty days. He come out. Rattlesnake rattle and Owl holler, "Ow!" Snake go back in.

Thirty days more. That snake come out. He rattle. Owl holler, "Ow!"

Three months. Snake rattle. Owl holler, "Ow!"

Four months. Snake rattle. Ain't nothin'.

Thirty days more. Snake rattle. Ain't nothin'. So that snake come out and look around.

Then an old person come along. Only he ain't person. He like a monkey. Call him es-te mat-tee. That means, "Person look all over." Anything he find he put in he's bag.

He say to that Rattlesnake, "You give me you fang."

That Rattlesnake he say, "I only got four fang. I give you two." Then he say, "You want Owl's claws?"

So he take rattlesnake fang and owl claw and put 'em in he's bag. That's how Indian get those Medicine.

When monkeys come along they can talk to animals. Hu-lots-kee, that's monkey.

["We call monkey, wo-wit ko koish-kee," Sam Jones commented. "That's 'Raccoon man.' "]

Es-te mat-tee, he get some medicine, but he doan know how to use it. Tha's before people come. When people come, es-te fas-ta, he come down. He bring lots more medicine. He show people how to use it.

HOW THE MEDICINE CAME

(Cow Creek version)

Kee-sa-kee tom-a-see, "the Old Man." His boy is stuf-a-sta (es-te fas-ta), that means, "Gives Everything."

It was very bright for 4 or 5 days before "Give Person" came. Lots more people come in. He give 'em gifts right on Indian River. Indians ask, "Where you come from?"

Stuf-a-sta give 'em everything—he give 'em land—he give 'em medicine—all kinds Medicine—oh, eight, nine hundred kinds. He give 'em rice and everything else. Only he didn't give 'em corn. He show 'em coconut shell rattle, you know, like Billy Stewart have for Buffalo Dance.

Last day he say to 'em, "Who want to be Medicine Men?" Pretty soon one Tiger say, "I." Then one Wind say, "I." But Birds scared. Everybody else scared.

[The name of the man from the Wind Clan was to-ka-long-chee, Josie Billy explained. The Tiger was to-wee-ah-kee. There must always be two Medicine Men.]

He say to them two men, "All right, you be Medicine Men. You take the Medicine. You take it out in woods. You build you a little hut. You clear out all around it so fire won't burn it. You put Medicine in it. Every night you sleep by it. You lie on west of Medicine. You hear him talk you better listen!"

When stuf-a-sta go he say, "Man comin'." In 'bout two–three weeks, fas-ta-chee, "Little Give," come. He look like corn. He about that tall [about 2 feet]. His hair like corn—his body all corn. He sit down and talk.

He take out little bag [about 3 inches long] with five or six corn in it. He say, "You know what that is?" They don't know. He say, "That corn. That good for you." He tell 'em all about grind it.

He say, "You build a shack, all logs close together—10, 12 feet high—15 feet square—15 and 15, plain square. You go now cut logs. Pretty soon dark."

He ask 'em how many camps. They say five camps. Not Bear, it too small. That's why he make log house that size. This be for all these camps. That log house ti-hee. He tell 'em he go to other camps. That ain't so. He give this corn to Tigers. That be for everybody.

Then they all go to bed, go to sleep. Corn man fix bed in corner. When everybody sleep, he slip out. Gone!

'Bout eleven o'clock, noise like electricity—"Hum-hum-hum-hum-hum-hum-hum!" They don't touch log house. That noise never stop all night. In the morning it stop. Then they open house. It's full of corn. When they open door it come out on the ground. They take that corn to everyone in five or six camps.

The next day they cut green logs. They burn out hole. They make pounding sticks. They put in a little corn—put in a little water. They pound that corn just like he told 'em. They pound it 'bout half an hour. Then they make sof-kee.

They use the rest of that corn for seed—that what's in the east side of the corner. They plant that corn 3 days after. It come up as good as can be.

All that time the Medicine Men sleep by the Medicine. One night there be a voice. That be after the corn man come. That voice sing song about the Medicine. There be four–five hundred kinds Medicine in that bag. That first night it sing 'bout three kinds at a time. Sometimes it sing 'bout five kinds Medicine put together—six or eight or three or two. Each kind Medicine, new song.

When that song done, that voice say, "You know that song?" Mebbe that Medicine Man don't know that song. He say, "I don't know that song." Then that voice sing that song again. By'm by that Medicine Man know that song. Some nights that voice ain't come, then they sleep all night. Sometimes there be three songs, sometimes five. Sometimes they get through eleven o'clock, then they go sleep. Sometimes they ain't sleep all night.

Them first two Medicine Men they got eight–nine hundred songs—mebbe thousand. They do this one-and-half years. Then he teach 'em one last song. That for all kinds Medicine. Then he say, "You know all them songs?" One Medicine Man he say, "I ain't sure 'bout this one." That voice say, "That other fellow, he know that one. You sing these songs to each other. When you wrong, he tell you." They do that half a year. Then they both know all them songs.

Then that voice he say, "Gotta do something them young boys—make 'em strong. You heat 'em stones. Take steam bath. After that you blood it all over body. You go up yonder—find it water—take bath all things—wash all over. Before daylight you count Medicine. See what luck you got."

This is a Cow Creek version. Josie Billy, ex-Medicine Man of the Miccosuki, does not agree that the Seminole came up out of the ground near Silver Springs.

HOW THE MEDICINE CAME (MICCOSUKI VERSION)

Indians came out of high hill near Atlanta in Georgia [according to Josie Billy]. Creeks come out of high hill north side of big river. Muscogee come out of big hill south side. There were 61 different tribes of Creeks—49 different tribes Muscogee: All people together 110 different tribes. Medicine leak out of another hill on Muscogee side. Just Muscogee get Medicine. They give it to Creeks. But first Muscogee make house for Medicine. Medicine say something—sing. Those two fellows don't eat 8 days.

When they go back, hear something at night—midnight—grab it. That's new kind Medicine. Know all kinds sickness. Tells 'em too.

AFRICAN ANIMALS

In the summer of 1938 I took Sam Tommie, one of the most articulate of the Seminole, to New York for a radio broadcast. In the week we were there, we visited the museums and other places of interest. In the Museum of Natural History are the marvelously lifelike Akeley groups of African deer and antelope in their natural surroundings. As we stood in front of the first case, Sam said, "You know what we call that animal?"

No Seminole had ever seen that animal before, or any of the animals in the exhibits. But Sam went down one side of the hall and back the other and gave almost every animal there a perfectly good Seminole name. They were descriptive names such as "Big Rabbit" or "Water Cow." "You know how I know about them animals?" Sam asked.

Then he explained that Sam Jones had in the Medicine Bundle about 38 points of horn—not full horns, but the white tips, and for each he has a description that fits one of the African animals. His descriptions run like this: "Hair like goat's hair. Hair and tail like a goat. Neck with white spots. White spot on shoulder. Stripe close to eyes. Horns close together then spread. Back tail white." I took him back 2 days later and we went over the animals again. In many cases he gave them the same names; in others, he didn't. Sometimes he gave the name to a different animal.

The net meaning of all this, it seems to me, is this: The ancient Seminole Medicine contains 18 horn points each accompanied by a description. These descriptions are not definite enough to identify the animal accurately, but are definite enough to eliminate any indigenous animal with which the Seminole might be expected to be acquainted. The suggestion has been made that the Seminole got these descriptions from the Negroes with whom they were closely associated at the time of the Seminole War and before, many of whom were fresh from their African homeland.

Sam Tommie's comment on the rhinoceros was particularly interesting as showing a definite aspect of the Medicine. The description was: "Two horns and round nose."

"They doan know what to do about that point," Sam Tommie said. "Sam Jones, he's afraid of it. Every time he touch it his hand swell up an' get sore. 'At's the worst horn Sam got. He think he just take care of it. Keep it in bag. Bring it out every 4 years. He doan know what it's good for. He doan touch it. He pick it up with sticks—like this."

Sam Jones verified these facts. The name of the horn is ee-ah-pee.

ONE ORIGINAL BUNDLE

From the beginning and until the time of the Seminole War (1835–42) there was only one Medicine Bundle. This was in charge of the two Medicine Men. There must be two Medicine Men for a Medicine Bundle, as Josie Billy pointed out, because of the rituals. Originally, as reference to the origin story will show, they were of equal importance. Today, the Medicine Man is infinitely more important than his assistant, who does not even have the title, but is called ee-ma-shwa, "stay with all night," or ka-a-pox-shee ee-ma-shat-see.

At the time of the Seminole War, Josie Billy explained, Little Chiefs came to the Medicine Man. "Going on long trip," they would say. "Got to have some of that Medicine." So the Medicine

Man would make up a Bundle with a little bit of each kind of that Medicine in it, and the Little Chief would take it with him and his war party. In that way, a lot of these little Medicine Bundles were lost. Others, the Florida Seminole think, were taken west. But at the end of the war, three Bundles were left in Florida, and these are the three Bundles in use today.

A great deal of the Medicine in the Bundles is for war; and, as Josie Billy explained it, "some of it is for people, and some of it is for people get hurt—like break your leg."

Ten years ago Sam Tommie told me about "Shot-in-the-heart" Medicine. Hil-eesh hat-kee, "white medicine," is Creek; ai-yicks hat-kee is Miccosuki. It is known also as "white roots," according to Josie Billy. This is the medicine Josie Billy told Robert Greenlee about. If it is used within 15 minutes of the time a man is shot in the heart, the man will get well. It was effective 100 years ago when it was used in the Seminole War, but there has been no opportunity to use it since. "Put in water, shake it up, drink it," is the method of use according to John Osceola, Medicine Man. Sam Jones, the oldest and most experienced Medicine Man, says that hil-eesh tock-fee, another Medicine in the Bundle, is even more effective. "Man die half an hour, put a little Medicine on each side mouth. Half hour he come to." This Medicine was made from a snake horn.

Another snake horn in the Medicine Bundles is the left-hand horn of the Snake King. Josie Billy told me the story.

THE HORN OF THE SNAKE KING

> Another thing in Medicine [Josie Billy says] is left-hand horn from King Snake. That horn got power. King Snake got horns. He live under rock. Two fellows go after him. One fellow got stick but he afraid. Other fellow, he got stones. He singin'. Snake he come out. Fellow throw stone. Break off left-hand horn. Right-hand horn more powerful but can't get that.
>
> That horn make huntin' easy. Hold horn in right hand. Start singin'. Deer come up right to horn. Not good now. Dead. Cold.

Sam Jones verified this story. There are pieces of this horn in each Medicine Bundle, and Nahaw Tiger's private Medicine is a piece of it, according to Sam Jones.

POWER IN WAR MEDICINE

One evening Sam Tommie stopped by my home. He had been traveling through and Josie Billy had told him to be sure to stop and tell me about cho-no-thlee, the "Power in War" Medicine that is in each bundle.

"You got to have cho-no-thlee in wartime or you can't win," he explained. "Osceola, he had that. Don't eat it, just taste it. [He illustrated by touching lightly several times with the tip of his tongue an imaginary something in his hand]. Mustn't eat all day when you use it. It's like hard stone—like marbles. Each Medicine Man got little piece. Not work just where you are—work way out, 20, 30 miles away. Indians have known it forever."

Independently of this, Henry Cypress had also told me something about this stone. "I think that's a spirit," he said. "Sometimes there; open package again, gone. Sometimes there, sometimes gone. That's little stone like old time make fire."

Cho-no-thlee is the Miccosuki word. The Cow Creek, Sam Jones told me, is sho-no-too toot-ka. I told him that Henry Cypress said it was sometimes there and sometimes not. "No," he said. "Always there."

There is a stone in the Medicine Bundles "like old time make fire." It is called "Medicine Stone," sat-too hil-eesh-wa (Creek); tal-lee ai-yicks-chee (Miccosuki). This is always used to start the Medicine Man's fire at the Green Corn Dance. It is also regarded as a sort of insurance. If the Indians were unable to get modern matches, they could always use this primitive method of making fire. Each of the older Indians also has a piece of flint as a precautionary measure. One day when we were discussing this, Tom Smith rummaged in his kit until he found his, and illustrated how he could strike fire from it with his knife.

THE BOSS STONE

Another stone in the Medicine Bundles is called sat-too his-sia-ka (Creek), "live stone." This is a small piece of the same kind of stone as is used in the sweat bath. The sweat bath stones themselves are called sat-too hi-yee (Creek), tal-lee hi-yee (Miccosuki), "hot stones." They would be ineffective without the stone in the Medicine Bundles. That is the head man—the big boss of all sweat-bath stones. It directs all sweat-bath stones in their proper duties even at a distance. . . . If the life were to pass out of it, the sweat bath would no longer be effective. But while the stone is in the Medicine Bundles and alive, the Seminole can pick up any stone of that kind and use it on the sweat bath confident of its power of cure and prevention.

The implications here are so profound, that I made a special effort to find whether there are any other "control" pieces in the Medicine Bundles. Two Medicine Men, Sam Jones and Josie Billy, both said definitely that there were not.

Nahaw Tiger, one of the Cow Creek group, was sitting beside me at the Green Corn Dance and began to talk about the "old Medicine—before Indian he come up." Nahaw studied the Medicine for some time, and at one time planned to be a Medicine Man. He is head man in putting on the Hunting Dance (Snake Dance, the Indians call it) each fall. He mentioned the deer-horn points, obviously the ones that Sam Tommie related to the African animals in the Akeley groups.

"Snake come up out of water," Nahaw explained. "Ma-tee beat him to death, make Medicine of him. That there."

"You've got some Medicine, Nahaw," I said. (This is the piece of the left-hand horn of the snake king mentioned above.)

"My uncle, Old Tustenegee, give me that medicine," Nahaw said, and changed the subject to some "big bull ants 'bout that long" (a little more than an inch) that are in the Medicine Bundles. Sam Jones says he does use "big bull ants" but there are none in the Medicine Bundles. He uses them as a treatment for rheumatism but he gets them as he needs them. The Creek name is ha-may-lay-ga.

It was Nahaw Tiger who, years ago when Billy Smith was Medicine Man, sold some pa-sa to a Tampa doctor for 25 dollars. It was an excellent example of misuse of Medicine and its disastrous results. Pa-sa (Cow Creek)—pa-see (Miccosuki)—is just about the most important drug in the Seminole pharmacopoeia and plays a very important part in the ritual of the Green Corn Dance. Nahaw wasted away until he was near death before he would confess his crime to Billy Smith and go through the rigorous course of treatment necessary to restore him to a right social attitude and to health.

Of course Billy Smith knew all the time what he had done, but it was necessary for Nahaw to realize his crime, confess what he had done, and be willing to demonstrate at the cost of great physical discomfort that he was willing to conform, before his cure could be effected. I will demonstrate this attitude toward crime and punishment still further at another point.

WAR RATTLES

There is a coconut-shell rattle in the Medicine Bundle, which I have seen at each dance. It is the most readily visible article in the bundle because of its size and characteristic shape, and because it is not wrapped. Most of the items are in little buckskin bundles a couple of inches long. Each of these is opened twice each Green Corn Dance: once almost as soon as the Medicine Bundle is brought from its hiding place in the woods to the dance ground before sunrise on Court Day, and once the following morning before sunrise before it is done up tightly again in its deerskin and taken from the dance ground to be hidden again in the woods.

I have stood within 6 feet of some of these packets as they were opened, quickly examined and folded up again, without being able to make out in the slightest degree what is in them. The rattle, however, can be identified from a distance. It, also, is a piece of War Medicine.

It is used only in the War Dance, where its purpose is to whip up emotion. As he picks it up to examine it, the Medicine Man shakes it lightly close to his ear to see that it is working properly, and then returns it to the Medicine Bundle.

HOW THE MEDICINE IS KEPT

The Medicine is always folded in a deerskin, tanned with the hair on and with the leg and neck skin. It is folded into a tight packet about 1 foot by 2 feet and 6 or 8 inches thick, with the hair side out. During the 24 hours it is displayed at the Green Corn Dance this packet is loosened. During all of Court Day the legs are tied together and the Medicine Bundle hangs in basket form on a stake to the northeast of the dance fire. In the early evening it is taken from the stake and arranged behind the Medicine Man and his assistant or assistants, half of the deerskin skin side on the ground, and the other half folded lightly over the Medicine, the open side toward the Medicine Man.

Between Green Corn Dances, the Medicine Bundle is kept in the Medicine Man's house. When the time comes for the Green Corn Dance, the Medicine Man does not take the Bundle directly to the dance ground. He takes it somewhere in the woods and hides it. This "somewhere" is to the east of the dance ground and out of sight of it. When the Medicine Man or his assistant goes for the Bundle, he walks east across relatively open country until he is out of sight. He is out of sight for some time before he reappears with the Medicine Bundle in his arms.

When he takes the Medicine away after the final ceremonies, he reverses this procedure, returning empty handed to the Dance ground and returning at some later day to regain his Medicine. If the weather is inclement and rain probable, the Medicine Bundle is further wrapped in waterproof cloth when brought from or taken to its hiding place in the woods.

NEW MEDICINE

When es-te fas-ta brought the Medicine at the very beginning of things, he was not done with it. Changing conditions would bring about new needs. So, when a new Medicine is needed to take care of a new condition, es-te fas-ta brings it. This is always the last night of the Green Corn Dance. The Medicine Man does not know when it happens, he learns it only when he goes over the Medicine and counts it the last morning of the dance. For a good many years during my early acquaintance with the Seminole, no new Medicine had been added. Sam Tommie told me the Indians thought this was due to "too many wires." The telephone, telegraph, and electric lines interfered. Recently, however, Sam Jones has received several new kinds—three at one recent Green Corn Dance.

Many of the Indians have their own private Medicine. This follows the same rules as the tribal Medicine. Life in it must be renewed periodically and this done at the same time. The private Medicine is collected by one of the Medicine Man's assistants who goes from clan camp to clan camp while the Medicine Man's fire is being kindled in the early evening of Court Day. Some of the Indians bring their own Medicine to the fire, where it is placed in the loosely folded Medicine Bundle with the tribal Medicine.

The individual Medicine is given back to the owner when the Medicine Man is counting over and examining his Medicine the last morning. The owner is standing over the Medicine Man who is squatted before the Medicine Bundle, opening one package after another. When he comes to the proper package, he hands it up to the owner who carries it to his hut.

I was interested to see, in 1946, the Medicine Man give back to John Osceola, who has since become a Medicine Man in his own right, his gun, which had been with the tribal Medicine all night. The purpose was to give it supernatural accuracy.

OTHER MEDICINE

Another Medicine about which Josie Billy told me is the "Thunder Bullet." This is tim-nee-kee in-tclee in Creek, tu-no-kat-see sa-kee in Miccosuki, the first word in each case being "thunder," the second, "bullet." This is also a War Medicine.

> When rain start coming, lightning strike tree. Go round and round and then in ground. Hurry up and dig it out. That in Medicine—White Stone—can see through it. Use it in wartime. Soldiers coming, Indians have that, go in swamp. White soldiers can't come, can't see 'em, don't know they there.

Some of the Indians mentioned Thunder Bird feathers, and said there were some in the Medicine. Josie Billy denies that there are any. Eagle feathers, yes; but no such thing as Thunder Bird feathers.

RELIGION

God is sa-kee tom-mas-see in Cow Creek. This is made up of sa-kee (breath), tom (everybody), mee-see (make it). In Miccosuki, God is fee-sa kee-kee o-meek-chee, which has the same meaning. He is not the Indian God—he is God. There is only one God, for Indian, for White man, for everyone. He lives far, far up in the sky and does not come down to earth.

Es-te fas-ta (person—give) is the intermediary between God and man. The Seminole identifies him with Christ and, in many cases, considers that he is Christ in the form in which he came to the Indians. In fact, this amalgamation of the two religions seems to have resulted from the impact of missionaries on the Indian. He retains his own, because he cannot conceive that everything that he and his ancestors have believed and practiced all their lives is utterly false. He naively blends the two. Es-te fas-ta was responsible for the collection of the Medicine by es-te ma-tee, and it was he who gave it to the Seminole at the great meeting at Indian River City. It was he, also, who instructed the first Medicine Men on how to use it. It is he who brings new Medicine when the Indians need it. Es-te fas-ta gave the Indians everything except corn, which was brought shortly after that great meeting by fas-te chee (fas-te, "give"; chee, "little").

Ho-la wa-gus corresponds to the devil. The word means "bad" or "evil," and is used in that sense as an adjective. Strong drink is ho-la wa-gus and so is a viciously quarrelsome man. Ho-la wa-gus lives down under the ground but comes to the surface to carry evil doers down below. He has all the earmarks of the devil. In fact the Christian devil may actually be his prototype. He is rarely mentioned.

This identification with Christianity, the monotheistic idea of one God only for everybody, the conception that the Christian God and the Indian God are one and the same, the identification of Christ with es-te fas-ta, and the similarity of ho-la wa-gus to the popular conception of the devil are provocative aspects of the Seminole religion. Therein may be the clue to the ease with which the Indian everywhere has seemed to adopt Christianity and yet maintain his ancestral religion alongside it.

Another surprising thing about the Seminole religion is the tolerance for other religions. I have never seen the slightest attempt to proselyte. The Seminole seems to accept Christianity not as a religion, but as an aspect of religion, and his own the same. The first is suited to the white man, the second to the Indian. He naturally resents proselyting when directed against his people because it means the destruction of usages and rituals he considers essential to his good. If he believes that the welfare of his nation depends directly on the observance of the Green Corn Dance, and that the continued neglect of this ceremony will result in the disintegration of his people, he can hardly be blamed if he resents the efforts of White missionaries to make him abandon it.

To recapitulate; the Seminole has experience with only two religions—the Christian and his own. He believes that the Christian God and his own are the same—that there is only one God. He believes that his religion is the relationship with God ordained for him, and the Christian religion is the one ordained for the White man. Both, he believes, are true.

Years ago Sam Tommie explained to me the Indian attitude toward prayer. A group of the Seminole were to meet a Government official from Washington to ask for certain things they needed. But before the conference they went off in the woods and prayed. I asked how they prayed, and Sam Tommie explained that they told God the things they needed.

"But He knows everything," I said, and Sam agreed.

"Then why did you have to tell Him?" I asked.

And Sam carefully explained that prayer is not for God's benefit, but for the benefit of the person praying. God knows without being told what is good for the Indian, and will give him what is right for him to have. But the Indian must never forget that everything good comes from God. Prayer, then, is not to ask God for favors, but to make the one who prays conscious of his obligation to God and, by implication, more worthy to receive the blessings that God sends.

Sleep, to the Seminole, is a kind of little death. In it the ghost comes out of the anus and, unhampered by physical laws of time and space, goes about having experiences. These experiences, remembered when the ghost reenters the body and the person wakes, are dreams.

In death, the ghost leaves the body and does not return. It does, however, stay near the body. Therefore the Seminole take the body to some isolated spot, on a well-hidden hammock, for example, and build a long, low, thatched hut with an elevated floor. It is just large enough to house the body. Fires are kept burning at the head and foot of this hut for 4 days, during which time a special black drink is drunk and no relative must leave. Then it is left to its ghostly habitant—for this is the abode of the ghost for the rest of time—nearby it will live its ghostly life, invisible to all mortals except "fortune tellers."

During Sam Tommie's trip to New York, we were looking through the exhibit of the Western Indian in the Museum of Natural History. In the section on "foods," Sam saw some mushrooms.

"People eat that?" he said in astonishment. "That ghost food. Ghosts eat that and itty, bitty bugs. You see those bugs around dead bodies."

The ghost lives a life, if such a paradoxial expression may be used, very much as it did before death. The catafalque is its home. If that is destroyed by fire, for example, the ghost is homeless and can only acquire another by marrying a woman who has one. At the next ghostly Green Corn Dance, he presents his problem to the ghostly Medicine Man, who provides him with a ghostly wife who has a home for him to share.

The soul is not the same as the ghost. If the Indian has lived a good life, sa-kee tom-mas-see reaches down and lifts his soul up to heaven. If he has lived a bad life, ho-la wa-gus comes up out of the ground and draws him down to eternal fires. This is probably not indigenous with the Indian but has been adapted from the teachings of Christian missionaries. If so, it is a concrete example of the naive blending of Christianity and paganism.

THE GREEN CORN DANCE

The Green Corn Dance has several names. It is generally known as ta-nah kee-ta (Creek); ta-nah kee-kee (Miccosuki). This means ta-nah (all people), kee-ta (get together). It is also called nah-kuff kee-ta (good time get together); and ah-til-lo kee-ta (serious business get together), which refers to the Medicine, Court Day, and the council. Literally, Corn Dance is at-see o-pon-ga (Cow Creek) or ah-spee tal-lil-wee (Miccosuki). This refers more properly to the actual dance itself, with its particular song, rather than to the several-day event with its rituals, ceremonies, and big program of dances.

The Green Corn Dance has two main purposes: to preserve the life in the Medicine and insure health to the individual. Or, as the Indian himself puts it, "So the Medicine live—so the people live!" It is also a necessary purification before the men can eat the now ripening green corn. A woman may eat the corn at any time, but even small boys must prepare themselves.

The site for the Green Corn Dance is selected by the Medicine Man with the greatest care, to insure privacy. It is moved from time to time. I have attended several Green Corn Dances of the Cow Creek Seminole, but the two Miccosuki dances differ in no essential detail. I have checked this with two Miccosuki Medicine Men. Medicine Men attend each other's dances. John Osceola, Big Cypress Medicine Man, was a regular attendant at Cow Creek. Cuffney Tiger, his predecessor, died at the Cow Creek dance in 1947. The Cow Creek dance, then, may be considered typical of all three dances.

The Cow Creek Seminoles, who constitute about a third of the whole Seminole Nation, are scattered through the pine lands around the northern shores of Lake Okeechobee, mostly in family groups at various points through the Brighton Reservation; at various spots off the Fort Pierce–Okeechobee Road; and for a few miles north of there. The country is pine lands, with occasional ponds and marshes, and intersected by some streams. Outside of the arterial highways that cut through it, the roads are nondescript. Those that lead to

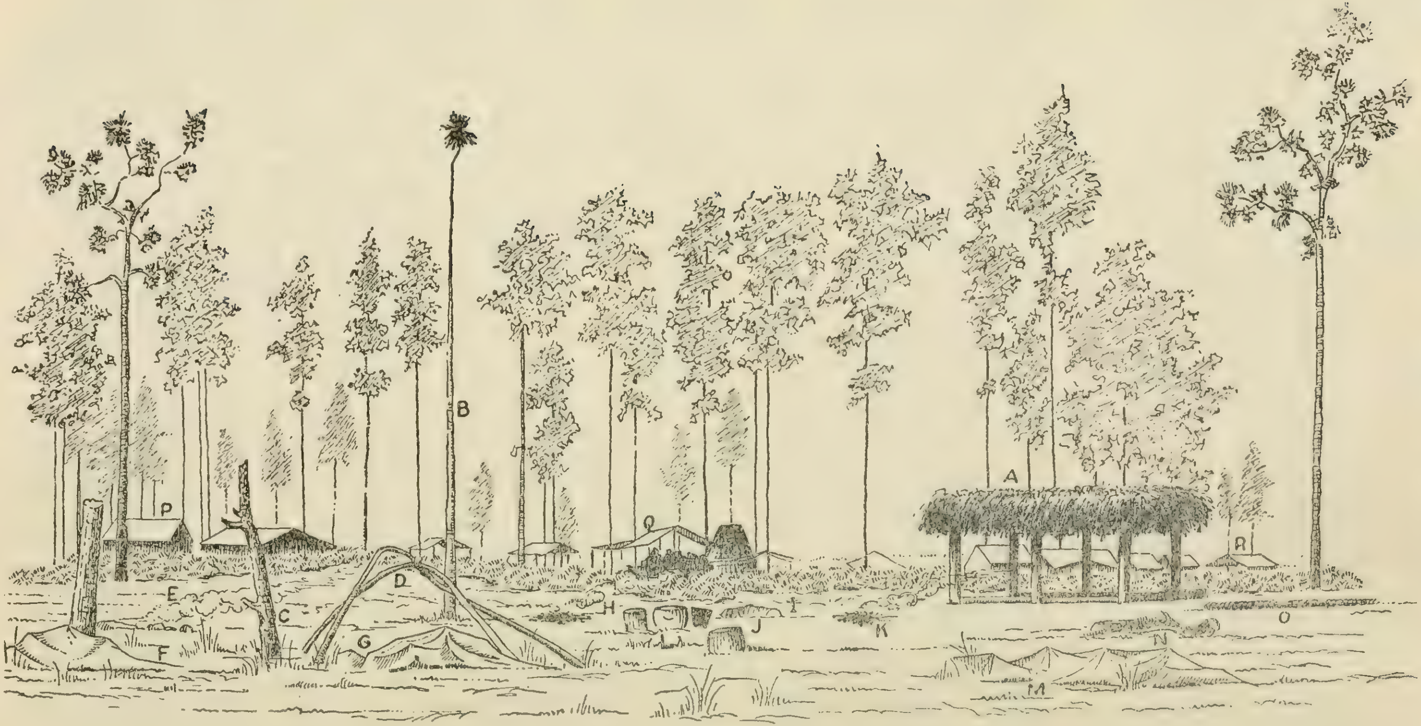
P
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Figure 7.—Green Corn Dance ground.

(Legend continued on following page)

and connect the Indian villages are nothing but a couple of ruts that branch and divide and rejoin in an utterly confusing way.

The Corn Dance grounds are at a distance from the nearest Indian village and from 4 to 6 miles off the road at the end of such a maze of tracks that one of the Cow Creek Indians has to guide the Big Cypress and Tamiami Trail Indians who attend or they could never find it. They are in a piece of well-drained land about four sections in extent called Grassy Island. It is mostly open country with occasional stands of sand pine.

The dance is held at the beginning of the "Everything growin' Moon," ha-see (Cow Creek); hi-yon-tsee (Miccosuki). This is the new moon the last of June or the first of July. The Big Cypress Indians date theirs the same way. The Indians on the Trail hold theirs when the "Seven Stars," the Pleiades, which have sunk below the horizon, make their reappearance. This last is an earlier date than the other.

Announcement is made by the Medicine Man of the date just a few days before, but even then the exact days of the important parts of the ritual may be inaccurate. Once the dance starts, however, there is no longer a question. For example, a couple of weeks before, and again on the Monday before, the Medicine Man told me that Picnic Day would be Wednesday, July 7. Actually it was Thursday, July 8. It is my experience that Picnic Day is 2 days after the calendar date of the new moon.

My first schedule of the Green Corn Dance, obtained years ago, called for 6 days and was outlined as follows:

First Day—Clear land; clean ring.
Second Day—Smokin' tobacco leaves.
Third Day—"Get wood day"; start dance—not before.
Fourth Day—Put up tchoc-ko thloc-ko. Picnic Day.
Fifth Day—Court Day.
Sixth Day—Black Drink Day—sat-kit-ta (Creek); hi-eet-see (Miccosuki).

FIGURE 7.

From a photograph taken just after the close of the ceremonies the last morning. It shows the three fires still burning. The clan camps are along the horizon line, the tchoc-ko thloc-ko in the right middle distance. The dance circle occupies the center of the picture, and the objects having to do with the Medicine are to the left. This is the first picture ever made of the dance ground.

Key: A, Tchoc-ko thloc-ko. B, Ball-game pole. C, Stake for Medicine Bundle. D, Frame of sweat bath. E, Smoke of sweat-bath fire. F, Tarpaulin. G, Sweat-bath tarpaulin. H, Smoke of Medicine Man's fire. I, Rough outline of Dance circle. J, Log seat of Dance director. K, Dance fire. L, Pails of Black Drink. M, Tarpaulin. N, Log pile. O, Log seat for men. P, Little Bird Camp. Q, Tiger Camp. R, Bird Camp.

The first 2 days are sometimes combined. On the other hand, in 1948, Sunday, July 4, was the first evening of dancing, and the ceremonies ended the morning of Saturday, July 10. The calendar new moon was the night of Tuesday, July 6. Thursday was Picnic Day and Friday, Court Day.

The Creek schedule is:

Nit-ta (Day) kats-ka (opening).
Ee-too (wood) ah-o-kah (get together).
Hom-pee (meat) shee-off (eat) Kee-ta (all day). Picnic Day.
Posh-kee-tah (fast) nick-ta (all day). Court Day.
Nick-ta (day) nots-ka (resting). Last Day.

The Miccosuki is:

Yo-ka ha-tsee-tee (smoking), or at-so-mee yo-ka ha-tsee-tee.
Ce-ta (wood) wee-kee (bring in).
Im-pee-kee (eating) nick-ta-kee (day). Picnic Day.
O-ko lin-chee (no eat much). Court Day.
Ka-a-pox-shee (this is the word for "tomorrow"), or nich-ta (day) no-leets-kee (sleeping). Last Day.

Various things determine the location of the Green Corn Dance. Privacy and isolation are the most important. There must be an open space of 2 or 3 acres, free of trees. The ground must be dry, a condition that varies from year to year. It is never near any permanent camp. And there must be no taboos. Cuffney Tiger, the visiting Medicine Man from Big Cypress, died at the 1947 Cow Creek dance. The Green Corn Dance will never be held in that location again. The new ground, used ever since, is about half a mile away.

There is no set time for families or individuals to arrive at the dance ground. Since it is the social event of the year, however, it is the custom to arrive early, especially for the women. Men with regular jobs are likely to come late—just in time for the essential rituals—unless they are needed to build houses, or unless they are willing to sacrifice their pay and jeopardize their jobs for a longer stay. Indian philosophy always considers a routine job as definitely secondary to a full life.

The houses at the Green Corn Dance ground are rarely thatched. They are used for only 5 or 6 days a year and it would not be worth the trouble or the necessary repairs. Instead, a tarpaulin is thrown over the ridgepole and attached to the side beams. Otherwise, the houses are of the same construction as the permanent houses, with a floor about 2 feet above the ground.

The clan camps are grouped in a rough semicircle, in general to the west of the dance circle. There are four or five camps. The Tiger and Bird clans are by far the largest. The Little Bird and Deer are small. There seems to be no regular order for the arrangement of

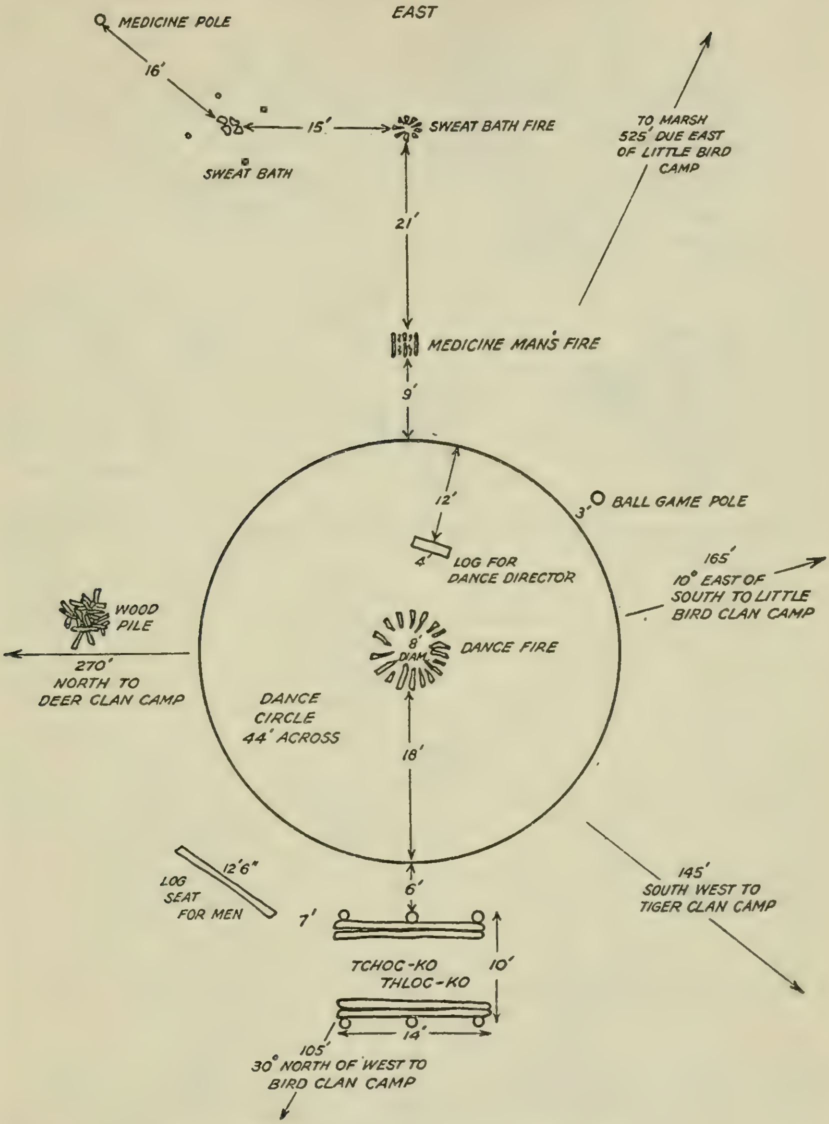
EAST
MEDICINE POLE
16'
15'
SWEAT BATH FIRE
SWEAT BATH
TO MARSH 525' DUE EAST OF LITTLE BIRD CAMP
21'
MEDICINE MAN'S FIRE
9'
12'
BALL GAME POLE
3'
4'
LOG FOR DANCE DIRECTOR
165' 10° EAST OF SOUTH TO LITTLE BIRD CLAN CAMP
WOOD PILE
270' NORTH TO DEER CLAN CAMP
8' DIAM.
DANCE FIRE
DANCE CIRCLE 44' ACROSS
18'
12'6"
LOG SEAT FOR MEN
6'
7'
145' SOUTH WEST TO TIGER CLAN CAMP
TCHOC-KO THLOC-KO
10'
14'
105' 30° NORTH OF WEST TO BIRD CLAN CAMP

FIGURE 8.—Ground plan of Green Corn Dance.

these camps, except that the Bird camp has been closest to the dance circle and tchoc-ko thloc-ko at each of the Cow Creek dances I have attended, probably because the Medicine Man, who is a Tiger, lives in the Bird camp, since his wife belongs to that clan.

Smaller clans camp with the smaller Deer and Little Bird clans; visitors from the Tamiami Trail and Big Cypress camp with the corresponding Cow Creek clans. In 1946, however, there were so many

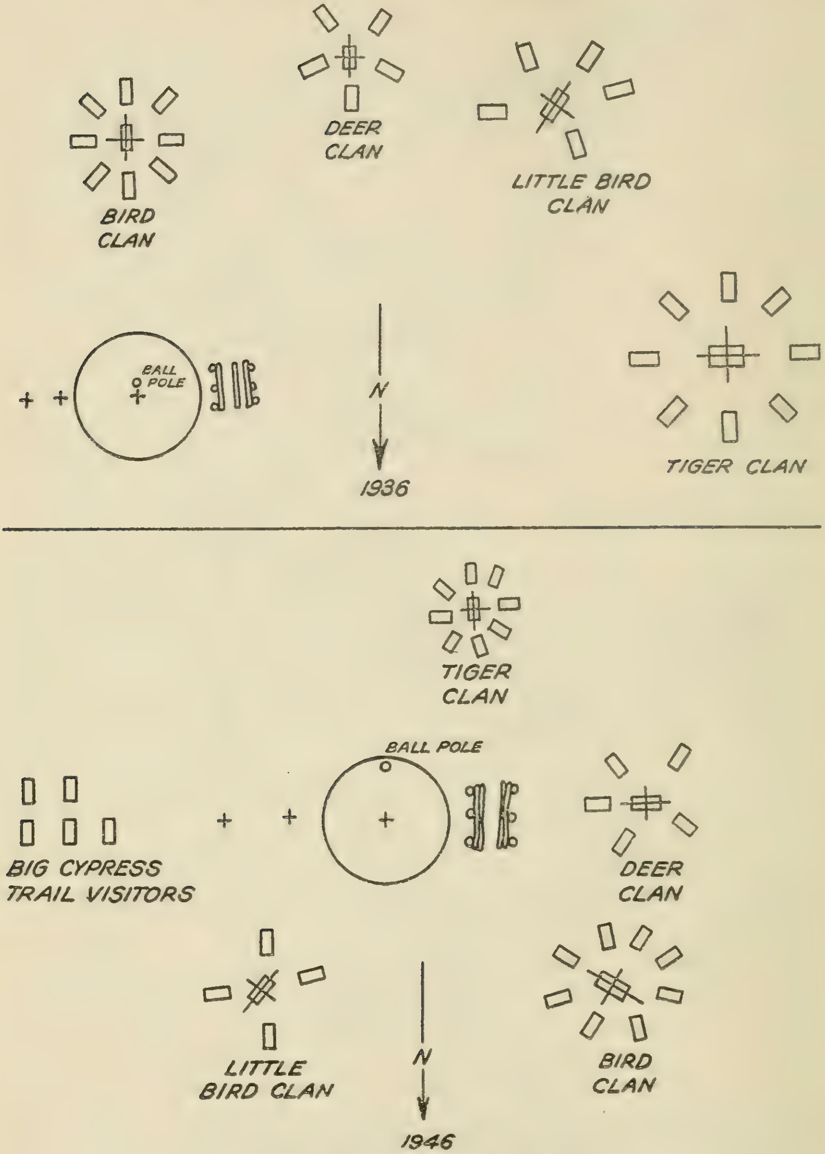
DEER CLAN
LITTLE BIRD CLAN
BIRD CLAN
BALL POLE
N
1936
TIGER CLAN
TIGER CLAN
BALL POLE
BIG CYPRESS TRAIL VISITORS
DEER CLAN
LITTLE BIRD CLAN
N
BIRD CLAN
1946

FIGURE 9.—Arrangement of clan camps.

visitors from the Miccosuki groups that a separate camp was established for them. Diagrams of the arrangements for three separate dance locations are shown herewith (figs 9 and 10). Since the floors and poles are permanent, the arrangement made when a new ground is first put to use is maintained until that location is abandoned.

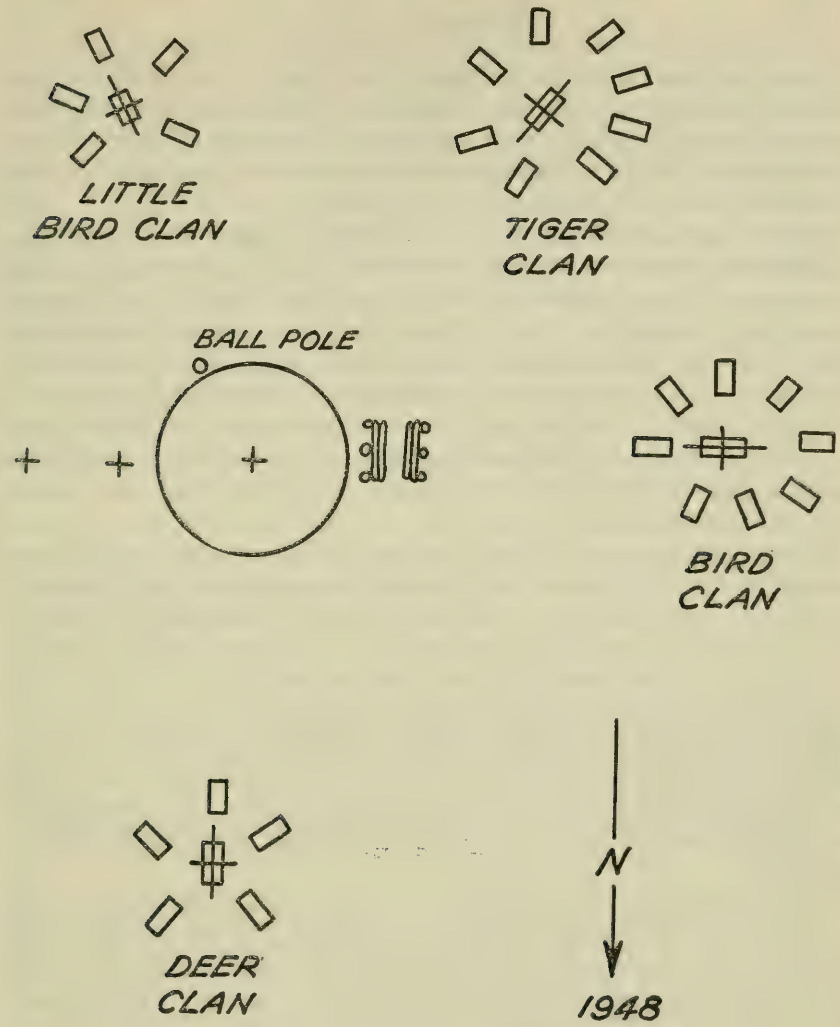
LITTLE BIRD CLAN
TIGER CLAN
BALL POLE
BIRD CLAN
DEER CLAN
N
1948

FIGURE 10.—Arrangement of clan camps.

The arrangement in each clan camp is the same as that in a permanent village. The houses are in a circle around a floorless cooking shack which is thatched. This is used in turn by the various families. Visitors put up temporary shelters in an outer circle on the side away from the dance circle. These shelters are like the regular Seminole hunting camps—low canvas roofs with palmetto fans spread on the floor and a cloth over them.

THE DANCE GROUND

The first thing done at the Green Corn Dance is to put the camps in shape and prepare the dance ground. Usually the dance is held where it was the year before, so there is little heavy work to do. Structures of the year before are put in repair and the dance circle is cleared of grass and weeds.

The dance track is about 10 feet wide and 40 feet in diameter, outside measurement. In the center of this is the dance fire. This is o-pon-ga (dance) en-tot-ka (fire) (Cow Creek); tal-lil-wee (dance) yo-ka-hee or ee-mee-tee (fire) (Miccosuki). On one side, just outside the circle, is the ball-game pole—ko-ka (ball) a-pee (pole) (Miccosuki). This is a tall pine sapling 20 to 25 feet high, trimmed of branches but with the plume left at the top. From about 4 to about 5 feet from the ground, this pole is squared and smoothed and on these flat sides score is kept with a piece of charcoal. This dance track is cleared, smoothed, and packed.

Every evening about sunset there is a ball game between the boys and girls. This is played with a deerskin ball stuffed with deer hair. It is about 2½ inches in diameter and roughly spherical. The object is to hit the pole with the thrown ball. To more nearly equalize things between the sexes, the boys have to catch or pick up the ball with a pair of rackets, while the girls may use their hands. These rackets are usually made of green laurel, flattened and doubled into a small loop about 4 inches across. The two ends of the strip are joined together to form a handle about 15 inches long. Two crossing thongs of rawhide close the loop. They are very similar to the rackets of the Cherokee.

While this is the usual method of making the rackets, the Indians are ingenious at making substitutes. I watched one of the older Indians rise to the occasion shortly before the dance began. He took a green palmetto-leaf stem and trimmed out a long strip about 1 inch wide and ⅜ of an inch thick. He bent this at the middle around a smooth log about 4½ inches in diameter, forcing the flat sides of the ends together as far down toward the log as he possible could, and there he tied them together with cord. He left the strip on the log a short time to set, and then he slipped it off. He tied the extreme ends together. Then he punched holes in the bow with a nail and made his cross thongs of ordinary cord. It was not too permanent a job. One of the rackets came apart before the game was over that evening, but it put his son in most of the game.

The game is pretty strenuous. The boys play the girls. The players divide into two groups with both boys and girls in each, and with the ball-game pole directly between them. The player holding the ball throws it at the pole. As the usual result is a miss, it is caught by a player on the other side of the pole, who, in turn, throws it at the pole or passes it to a team member who is in a better position to score. The ball crosses from side to side of the pole until the pole is hit, and a score is registered for the side (boy or girl) to which the player who threw the hit belongs. There is nothing restrained or formal about the game. It is full-blooded, unrestrained fun. There is feinting and blocking and efforts by the girls to wrest the ball from the boys. The girls run and tumble about with suprising agility despite their long skirts.

As dusk approaches the ball game ends, and the girls go back to the camps. Some of the men have been sitting in the tchoc-ko thloc-ko watching the ball game or talking. At all times the tchoc-ko thloc-ko is a clubhouse for the men—a place common to all the clans, where the men may sit and talk. It is at all times taboo to the women and so is the dance ground itself. They can only be on the dance ground when they are actively dancing or playing ball. Following the ball game, the dance circle is swept with long branches and the fire started.

HELPERS WITH THE MEDICINE

This sweeping is done by two young men who have a very important part in the Green Corn Dance ritual. They are the Medicine Man's "Helpers." They are not to be confused with the "Assistant" or "Assistants," who are older men, already proficient with the Medicine, and who are within one step of being Medicine Men themselves. These young men are known as hi-leesh put-cha-chee (Medicine Man's) ma-na-cha (Helpers) (Cow Creek); ai-yicks-chee (medicine) in-da-hus-kee (servant); or ai-yicks-chee (medicine) ho-po-yee (look for) (Miccosuki). They usually have a present intention to become Medicine Men, but they are only at the beginning of a long, hard road. Their duties are manifold. They act as police to maintain order, to escort unauthorized persons from forbidden places, and in general, to carry out the orders of the officials. It is their job to find the different herbs that go into the three Black Drinks. They will prepare the two cold Black Drinks the morning of Court Day and on the final morning they will bring to the Medicine Fire any laggards or evaders for the scratching.

With the coming of dark, the dance fire is built up and the dancing begins. It is in charge of a "dance boss," o-pon-ga ma-noi-ya (Cow Creek); tal-lil-wee sin-ka-pa-ta-ni (Miccosuki). He does not dance himself, but he determines what dances shall be danced, who shall lead each dance, and orders people who are not dancing into the dance. He does this by a running fire of conversation punctuated by staccato and explosive ejaculations of "Staos!" which corresponds to "Ladies and Gentlemen." He also whips up the dance if it seems to lag. If a dance boss fails to get results, he is replaced by another.

When the kind of dance has been decided, the leader takes his place in front and to the right of the tchoc-ko thloc-ko facing east. Other men and boys who are to start the dance, take their position in a line to his left, also facing east. The leader starts the dance song, usually keeping time with a rattle. He sings a phrase and this is repeated by the others. Then he turns to the right and begins the dance, counterclockwise around the circle. Now the women, who have been sitting out in the palmettos, begin to come in and take their places beside the men, to the men's right, on the side away from the fire, and soon the dozens of rattles on the women's legs give loud cadence to the dance.

TIN-CAN RATTLES

The rattle of the Seminole Indian of today is one of his few concessions to the White civilization by which he is surrounded but by no means engulfed. The turtle-shell rattle, the coconut-shell rattle, and the deer hoofs that used to be tied to the women's legs to make the dance cadence are no more, or are seen only occasionally. The evaporated-milk can makes a much more satisfactory noise and is universally used. In its original function, the Indian has punched two holes opposite each other in the top, one to pour from, the other to admit air to make the pouring regular. When the can is emptied of milk, it is punched full of nail holes, sometimes in a regular design, sometimes hit or miss. It is cleaned, the paper taken off, and beads or the seeds of the wild canna inserted through the two original holes in the top. The metal which has been turned back from these, is now pulled out again to keep the beads from coming out, and the Indian has a rattle with far more zip than anything he originally took from nature.

Some 12 or 16 of these can rattles are tied together, and, with a burlap pad to keep them from chafing, a whole bundle of this kind is tied to each calf of a woman dancer's leg. Beneath her long skirt they are quite invisible, but as she walks there is a continual rustling. Once she starts to dance, however, she controls the sound with rhythmic jerks of her leg and the result gives a terrific beat to the dance.

The women's rattles are more likely to have the harder beads, and there are fewer of them. This makes for a higher, sharper tone. It also means the weight is considerably less, which is an important consideration when so many are worn. The men's rattles are about a third full of the seeds and give a rather prolonged "shuck" sound.

Each of the men carries a small palmetto fan in his left hand, the hand toward the fire. This is a palmetto frond cut down to a fan about 9 or 10 inches across. He holds this steadily between his face and the fire. If an onlooker is holding one of these fans in his hand, it gives the dance boss the privilege of ordering him to dance and he cannot refuse.

If the dance leader is using a rattle, he holds it in his right hand and beats with it at, but not touching, his left hand, which is held cupped in front of him. This is still the position and action of the rattle during the active dancing. When each movement of the dance is finished, however, he lifts the rattle high above his head and shakes it vigorously. At the same time he stops and the line stops behind him, the men giving shrill yips. They rest for a minute standing in line, and then the dance is resumed, the leader taking up again with his rattle, starting the chant again and resuming the dance step. The end of the dance is signaled in the same way, but the leader, instead of standing, walks away. The men go back to the tchoc-ko thloc-ko and the women to their groups in the palmettos.

These groups are seated on the ground just off the path from each clan camp to the dance ground, and about two-thirds of the way from the camp to the dance ground. Here they sit and chat and smoke cigarettes and watch the dancing when they are not dancing themselves. If mothers have small children who cannot be left alone in camp, they are put to sleep under muslin canopies stretched in the palmettos. This is particularly true the last night when the dancing goes on all night.

If the dance or the dance song is complicated, special instructions are given before the dance starts. This, for example would be the procedure when the Green Corn Dance itself is danced the first time the evening of Court Day. East of the dance fire but within the dance circle, is a large log about 4 feet long. The dance leader, one of the older, experienced men, seats himself on this log with his rattle. The dancers, instead of forming in front of the tchoc-ko thloc-ko, form on the opposite side of the dance circle facing him. The women, in this case, come in from the palmettos and join the dance before it starts. When the dancers have been instructed, the leader from his seat starts the cadence with his rattle and the chant with his voice. When the end of the movement comes, he signals the stopping point when the leading end of the dancing group is in front of him. He now instructs for the next movement and that is danced, and so on until the dance is ended.

THE DANCES

All the dances up to midnight of the last night are "fun" dances and have no ritualistic significance. There may be an exception in the Feather Dance, when that is danced every few years on Court Day. Josie Billy, however, has assured me the purpose of the Feather Dance is to keep the men awake on a day of significant fasting and purification. The formality of the preparation for this dance inclines me to believe there is much more to it than that.

The fundamental dance that runs through each evening of dancing and accounts for more than half the numbers, is called "just dance." For the men, it is the characteristic double step of the Indian dance, which can be whipped up into a stomp by the dance boss. The song seems to be left largely to the discretion of the leader. He makes it up as he goes along. Since it is fundamentally simple, the younger men often lead it, leaving the more intricate dances to the elders.

Most of the dances are nature dances, based on the actions of some animal with which they are familiar. Their favorite of all dances is the Catfish Dance, in the characteristic phase of which the arm from the elbow makes circles like a wheel, in imitation of the catfish's fins, as the Indian man curls out from the line and makes a close circle to the right.

The Alligator Dance is similarly spectacular. At a certain point and while dancing, everyone suddenly faces to the right, and the men take the women by the shoulders and sway them back and forth. Both ranks then face completely about and the women take the men by the shoulders and sway them back and forth. The undulating line of dancers looks uncannily like a writhing alligator.

The Buffalo Dance I have seen danced always in the afternoon. In this dance the imitative work is done by the leader. The best leader of this dance, in my opinion, is the Medicine Man himself, Sam Jones. Years ago, when I saw him lead it, he held a small tom-tom in the crotch of his left arm against his body and beat it with a small padded stick. For much of the dance he danced backward, beating out the rhythm with the tom-tom, pawing the ground, snorting, and tossing his head. This is the only dance in which I have seen a tom-tom used. On one occasion, one of the Trail Indians left the dance ground during the dance and came back with his rifle, which he fired in the air at intervals during the rest of the dance.

Another favorite is the Steal Dance, in which one of the boys dancing in the rear of the line, sneaks swiftly up to the front of the line, seizes one of the girls by the arm, and dashes back to join the dance again with his new partner. The one now bereft then steals a partner of his own. Another is the Gun Dance in which the characteristic action is aiming and firing a gun. Among other dances are the Woodpecker Dance, the Screech Owl Dance, the Quail Dance, and the Chicken Dance.

The Medicine Man does not dance in the evening dances. He does dance in the afternoon, as leader and to instruct. Very often in the afternoon, one of the older Indians will be teaching the children one of the dances. Children as young as 6 or 7 years take part in the evening dances, and even younger children take part in the afternoon, learning the dances.

The Medicine Man usually sits on the back log in the tchoc-ko thloc-ko, leaning against one of the uprights. Others of the older men sit in the tchoc-ko thloc-ko and on the log adjacent to it, or logs, if there are more than one, and the male dancers return to it between dances. The Dance Boss is on his feet most of the time. He does not dance himself. He may hold a switch or stick as a mark of authority. He often throws logs on the fire, though this is the particular job of the helpers.

There is naturally more or less passing to and fro along the paths that lead through the palmettos between the dance ground and the clan camps. With a moon so new, the nights are dark, but the Indians rarely carry a light. The light from the dance fire is a great help, especially when going in that direction. For the rest, after a little while you have an instinctive idea of where the path is. Apropos of this, I was walking with one of the Indians along one of the paths, when he made this trenchant comment, "Not walk so fast, snake not hit you." Needless to say, my progress from then on was very sedate, although I have never heard of an Indian being "hit" under these circumstances.

The dancing usually lasts 2 or 3 hours on ordinary nights, and then the last die-hards go back to the camps, the last bed canopies go up and the last lanterns go out, the fires die down, and the life of the camps is frozen in sleep. Only the dogs in a mad, yelping pack race from camp to camp; the little night frogs whistle; and now and then a screech owl's tremulo breaks the night.

It is a never-to-be-forgotten sight—the Green Corn Dance grounds at night. In the camps, the huts, gray-walled with the bed canopies, are motionless, silent and ghostlike in the almost-dark. Yet you know that life is there behind the sheerest of walls. You know it is there from the occasional cry of a child and the low, quieting murmur of the mother. Down at the dance ground the dying dance fire sends up a momentary Vesusius of sparks as a log falls apart, and above are the diamond-bright stars of the incredible Florida night.

PICNIC DAY

Picnic Day is the first break in the routine. This is the big feast day for which the Medicine Man provides the meat. Probably in the old days, he killed three or four deer. Today he buys one or two beefs, kills and butchers them himself, and divides the meat among the different camps. He is helped in this by contributions.

Picnic Day is also the time for new thatching on the tchoc-ko thloc-ko and new plumes of pine or new green branches at the corners. Pine plumes were the decoration when I first went to the Green Corn Dance. Today the tchoc-ko thloc-ko roof is edged with sweet bay. Picnic Day is a day of feasting against the morrow when no man may eat. All day long food is brought to the tchoc-ko thloc-ko and the men gorge themselves. All day long there are pans and kettles full on the ground between the log seats, and these are replenished as they are emptied. Women of all the camps and families keep up the supply indiscriminately. But still the taboo against the women is maintained. They may not come on the dance ground or into the tchoc-ko thloc-ko. They bring the food down to the dance ground and leave it there at the edge. It is brought in by the men. The women stand outside and indicate which of the empty dishes belong to them, and the dishes are handed out by the men for replenishing.

Dancing on Picnic Day lasts until full midnight. When the men are not dancing, they are eating, and the efforts of some of the men to get the last mouthfuls of food and the women to get the empty dishes when the day's dance is over, almost results in a tug of war. Then the camp settles down for the night. The preliminaries are over. The serious business of the Green Corn Dance will begin in the morning.

COURT DAY

Court Day dawns. The first gray in the east shows about 5 o'clock at this season of the year. With it, the Medicine Man is up and about. He alerts his assistant or assistants. The Miccosuki name is ka-a-pox-shee (tomorrow) ee-ma-shat-see or ee-ma-shwa (stay with) (or stay with all night). At the present time, Sam Jones' three brothers all act as his assistants to a greater or less degree. For a great many years, Oscar Hoe was the principal and, at times, the only assistant. It was generally understood that he would be next to have the Medicine Bundle. The last couple of years, though, Frank Shore, another brother, has taken the most prominent part, and it is expected now that he will be the next Medicine Man. Charlie Micco has played a minor role. One or two of these brothers will sit beside Sam Jones behind the Medicine fire all night of Court Day—hence the name "stay with all night."

The three men, Frank Shore, Sam Jones, and Oscar Hoe, with the Medicine Man in the middle, walk abreast from the Bird Clan camp to the dance ground, across it and on, approximately 175 yards to the marsh, where they strip and bathe, facing the east, and the Medicine Man rubs the water on his body and sings the song asking sa-kee tom-mas-see to keep the medicine from harming him, and to let him use it for the good of the Indians. They resume their clothes, and the assistant (in this case, Frank Shore) goes on to the east and out of sight, taking with him an empty deerskin. He has gone for the Medicine Bundle. The other two return to camp.

In the meantime, the two boys—the Medicine Man's helpers—are beginning the preparation of the two morning Black Drinks. The ingredients have already been assembled and are under palmetto leaves to the northeast of the dance circle. The first of these is pa-sa (Creek) or pa-see (Miccosuki). This is *Eryngium synchaetum*, the button snakeroot. This herb is used by the Seminole in many ways. It is a heart medicine, and is also used by the Medicine Man in his treatment of a criminal who has been outlawed and wishes to regain his normal place in the tribe. It is used by the Medicine Man to insure life. That is, if anyone will eat three roots given him by the Medicine Man with appropriate ceremonies, he will not die within 5 years. This plant has been brought in whole in bundles, the stem with attached leaves and fruit, roots, and tubers. The tubers are cut off with a hatchet and chopped up. They are put in a pot with cold water, the cold infusion making the first Black Drink.

This made, they start the second Black Drink, made of a cold infusion of the inner bark of the willow, *Salix amphibia*. The Cow Creeks call this black drink, ac-wa-nah; the Miccosuki, o-kee box-see (medicine water). The willow is brought to the dance ground in the form of a green log about 3½ feet long and about 6 inches in diameter. The outer bark is first removed from almost all of the log in long, narrow strips. Then the inner bark is taken off in long, narrow strips and the pot is lined with these, placed vertically around the inside. Then water is poured in and allowed to stand.

Prayers are blown in this Black Drink, but not in the first one of button snakeroot. This is done through a hollow reed about 3 feet long. Any hollow stem may be used but usually it is that of the cattail. This is wound with three strips of red cloth, one at the end and two others equidistant up the stem, but leaving about 6 inches at the mouth end unwound.

Ideas differ as to the meaning of this red cloth. One Indian said to me, "Some people think it means 'Red People' but I think it means 'blood.'" He was probably right. One of the Medicine Men assured me it is to make the Black Drink prevent "female diseases." Of course it is not to prevent "female diseases" in women, because they do not take the Black Drink. It is to prevent "female diseases" in men.

With the Seminole, blood is associated with women because of their menses. For example, when a friend of mine had a bloody flux, the Medicine Man told him he had a woman's disease and would have to be treated by the old women. He went back to the old home camp and his mother doctored him. Thus the old women doctor all female diseases when they are suffered by either men or women, and the Medicine Man or the plain "doctor" treats both men and women for all regular diseases. Herein is also the reason that the women do not have to go through the purification ceremonies as the men do. They purify themselves every month.

The Medicine Man's assistant (in this case, Oscar Hoe) stands by the two helpers. He also blows prayers in the Black Drink. And so may the Medicine Man. Josie Billy, former Medicine Man from the Trail, told me he named over each part of the body and blew the name into the Black Drink; when the Indian rubs it over each part it will be a preventative for anything affecting that part. The Medicine Man himself stands where he can watch the preparation of the two Black Drinks and sees that it is done correctly.

Once you have seen a stripped willow log that has been used to make medicine, you cannot mistake it. Once, leaving one of the Big Cypress camps, I came on such a log. I held it up and called back, "You been making Medicine?" They nodded, "Yes." I mentioned it in another camp a little later. "That's right," I was told. "Jes' been a baby born that camp." So, obviously, the "medicine water" is used in childbirth.

An important point for the Medicine Man's assistants and helpers is, when they turn around, always to turn to the left. "Always got to turn around one way. Turn like this [turns to left]. If they turn around like this [turns to right], maybe make everybody crazy. es-te-fas-ta watchin' all the time. See 'em turn like this [turns to right], say, 'All right, make everybody crazy' [sweeps his hand].

"Dance same way. Always dance one way around fire, Big Country in North, Little Country in South. Always dance from Big Country to Little Country." This results, of course, in the dancers and the dance line continually turning to the left about the fire.

THE MEDICINE BUNDLE

In the meantime the Medicine Man's other brother, Frank Shore, the next-to-be Medicine Man, has come back onto the dance ground. He has the Medicine Bundle. It is in the deerskin, folded loosely over into a covered basket form, the legs, crossed and tied, making the handle. And Frank Shore is carrying it by this handle. I have seen Sam Jones, the Medicine Man, himself bring in the Medicine in a tight bundle, clasping it in his arms. That was years ago. Now he has a successor nearly ready and turns more duties over to him.

The Medicine Bundle is put down just off the dance circle, directly to the east. The Medicine Man's assistant (or the Medicine Man) squats down in front of it facing east, and begins to examine the different packages it contains. In each case, the buckskin thong must be unwound; the buckskin package opened; the Medicine examined; the package closed, rewound with the thong, and placed in a deerskin. There is a transfer here from the Bundle to another deerskin.

At this point the actors are disposed as follows: To the northeast of the dance circle the two helpers and one of the Medicine Man's assistants are making the two Black Drinks. To the east of the dance circle, the Medicine Man's other assistant is examining the Medicine in the Bundle. The Medicine Man himself stands between the two groups. There are a number of men in the tchoc-ko thloc-ko; some have gone down to the marsh to bathe; some are standing by one or the other of the Medicine groups watching.

Now the Medicine Man goes over to the assistant who is going over the Medicine, squats down beside him on his left and begins to go over the Medicine with him.

When the two helpers and the assistant who have been making the two Black Drinks finish, they spread palmetto fans just off the dance circle where they have been working, and put on them the pots of Black Drink and several cups which they have thoroughly washed.

When the Medicine Man and his other assistant finish going over the packages of Medicine, the deerskin is folded in loosely, hair side out, and the legs tied again to make a handle. A 6-inch branch of wood about 6 feet long with a fork near the top, is worked into the ground until it is firmly set. In 1949, the forked stick from the previous year was still in place. It was worked in more firmly, however, and braced with stones and a log. The Medicine Bundle is hung on the fork, where it will remain until evening. The Medicine is "out."

It is now about 6 o'clock and the first phase is over.

SCRATCHING THE BOYS

While the men must fast from the midnight that ends Picnic Day to the end of the ceremonies at sunrise the second day following (approximately 30 hours), the small boys are not expected to. They come down to the dance ground and each is given a plant of pa-sa. He takes this back to camp and makes his own Black Drink. This he rubs over his body; an older man gives him a token scratching with needles, and he can eat.

All males must be scratched. This purifies the blood and protects the Indian from blood poison during the year to come. The men are scratched thoroughly and purposefully. Probably it was done in the first place with animal claws or snake fangs because each stroke leaves several parallel marks as though an animal had done the scratching. When I first knew about it, it was done with ordinary steel sewing needles held between the thumb and first finger. Three were as many as most men could manage, but an expert could hold four. Today these needles are run through a little block of wood, and there may be six. Greenlee heard of teeth of garfish set in bone being used, but I have never seen or heard of it otherwise.

Most of the men will be scratched the next morning, but a man can be scratched on Court Day, particularly if he cannot be there the next day.

The boy babies are scratched at the tchoc-ko thloc-ko, and several of the older men, including the Medicine Man and his assistants officiate. The mothers bring their children down from the clan camps and wait out in the palmettos, since the dance ground and tchoc-ko thloc-ko are taboo to them. The younger men go out and bring the children in. Babies in arms they carry, but the toddlers are led in by the hand. The scratching of the children is very light. "Just scratch a little bit," said Sam Jones, speaking of the babies, and he traced a minute cross on the back of his hand. As soon as a child can walk, he is scratched on the foot also. The children cry vociferously, but it is more from fright than hurt, because once a child is put down he shuts up like a faucet and toddles happily about. Once scratched, the children are returned to their mothers and taken back to camp.

The older boys, those old enough to take part in the dancing, are scratched as completely as the men, but not as deeply. By this time the boy's pride has developed to the point that he is ashamed to show hurt or fear. He walks boldly up to the scratching and takes it like the man he considers himself. One of John Osceola's grandchildren, a youngster of about 5, was playing with his grandfather when I visited the camp in September. I asked the boy if he had been to the Green Corn Dance, which had been in early July. His grandfather answered by pushing back his sleeve and showing the scratch marks on his arm. Incidentally, you can always tell, for several months thereafter, when a Seminole has been to the Green Corn Dance. The scratch marks will show below his sleeve.

The incident above illustrates another phase of Seminole life, the affection for children. Men will play for an hour at a time with a child or grandchild and never seem annoyed to have children about.

THE FEATHER DANCE

Every 3 or 4 years, at least, the Feather Dance is danced. One Indian told me he thought it started as an effort of the Bird Clan to make their clan totem a god. Josie Billy, the former Medicine Man, insisists that it has no significance, that it is merely a "Day Dance" like the Buffalo Dance, and that its purpose is to keep the men awake, who, otherwise, would tend to sleep all day.

However, it differs from the Buffalo Dance in several respects. The Buffalo Dance is danced several times during the Green Corn Dance every year. The Feather Dance is not danced every year, but it must not be allowed to go 4 years without being danced. The Buffalo Dance is informal and is danced casually. The Feather Dance is very formal, is danced according to a rigid pattern, and is full of ritual. It is difficult, exhausting, and an extremely long dance. It does not seem possible that such effort would be expended merely to keep the men awake. And if so, why isn't it danced every year?

Whenever I have seen the Feather Dance danced, Nahaw Tiger has been dance director. Usually the bird, a white heron, is killed and brought in the day before. In 1949, however, the Medicine Man told me the evening before there would be no Feather Dance the next day because the boys had not been able to kill a bird. Later in the evening I was told there would be a Feather Dance—that the boys were going out first thing in the morning to get a bird. Finally, Nahaw Tiger stood up in the tchoc-ko thloc-ko late in the evening of Picnic Day and announced in a long and formal speech that the Feather Dance would be danced the next day.

Jack Smith, one of the young men, went down to bathe with the Medicine Man's party the first thing the morning of Court Day. Later he went out of camp with something round done up in a white cloth over his shoulder. About half an hour later he came back carrying a Ward's heron by the neck. "Couldn't get a white bird," the Indians explained. "He got a gray one." He had shot it, but he did not take a gun with him, nor did he have one when he came back. The heron was hung by a cord about its neck to the southeast corner of the tchoc-ko thloc-ko.

At this point a deerskin tanned with the hair on was necessary, but none had been provided nor was there one in any of the camps. So four of us drove 20 miles to Tom Smith's camp and got one. When we came back, the heron had been moved to the center of the east side of the tchoc-ko thloc-ko. The deerskin is spread, hair side down, in front of the center of the tchoc-ko thloc-ko. The heron is taken down and put on it. Now one of the men begins to pluck some of the medium-sized feathers of the bird.

In the meantime some sixty saplings about 10 feet long have been chopped off roughly and trimmed of leaves. One or two feathers are tied loosely to the small end of each of these and the butts are trimmed. They are leaned against the tchoc-ko thloc-ko.

The neck of the heron is skinned up to the head and the head is cut off with the neck skin attached. This is run on a pole about 6 feet long. The body of the heron remains on the deerskin for some time, but finally it is taken up and thrown on top of the tchoc-ko thloc-ko.

Just before 10 o'clock, Eli Morgan and Frank Shore sweep the dance path with long leafy branches which are then thrown on top of the tchoc-ko thloc-ko. Shortly after 10 o'clock, Nahaw Tiger takes the pole with the heron's neck and head and, holding it in front of him with both hands, vertically, with the beak to the front, he advances from the tchoc-ko thloc-ko east across the dance circle to the far side. He stands there, holding the pole before him and gives four, loud, spaced whoops. Then he returns to the tchoc-ko thloc-ko. He repeats this at 5-minute intervals until he has done it four times. Sometimes he is answered by whoops from the distant camps.

Almost immediately after the last call, the men begin to line up in front of the tchoc-ko thloc-ko for the dance. Two men divide the bundle of poles with the fluttering feathers. The pole with the heron's head is in one bundle. They are the men who have earlier swept the dance floor, Eli Morgan and Frank Shore. Each carries his bundle of poles under his arm and gives one to each dancer as he joins the dance. Only the men dance.

The dance in 1946 was led by Sam Jones and Oscar Hoe, the Medicine Man and his assistant. In 1949, it was led by Frank Tommie and George Osceola, neither of whom has any official position. The two leaders stand facing the tchoc-ko thloc-ko at the south corner, one behind the other. The dancers line up in two ranks to the north.

The two leaders now face to the south and Frank Tommie (Sam Jones, in 1946) intones a chant, the two leaders beating with their rattles against the palms of their left hands for the rhythm, and the dancers repeating each phrase as it is finished. The leaders, followed by the double rank of dancers, slowly dance to the south position, the two men with the extra poles bringing up the rear. Here the two leaders raise their rattles above their heads and shake them, slowly turning in their tracks until they are facing the dancers. The whole line is marking time. The two leaders bring their rattles down again, beating them as before and Frank Tommie goes on with the song, the line holding its place and marking time.

The dancers are holding their poles vertically in their outside arms, the outside dancers, in their right arms; the inside, in their left. The women are watching from the edge of the camps, sitting on the nearest floors or in the palmettos. They, of course, cannot come on the dance ground. They seem to show more interest in this dance than in any other phase of the ceremonies.

The line, with the two leaders facing backward and everyone marking time, continues in the south position until the song is finished, which is indicated by the leaders raising their rattles above their heads and shaking them. There are several shrill whoops from the dancers. Then the leaders face about, start the song again and lead the dancers to the east point of the dance circle. Here they face about again, the line marks time, and the whole procedure is repeated. The dancers tour the four cardinal points of the compass four times, ending at the west.

Now a change takes place. Frank Tommie leaves his position beside George Osceola at the head of the line and goes and stands at the south position facing back at the dancers who are held marking time at the west position. He shakes his rattle and the line, led by George Osceola, dances slowly toward him. When it reaches him, George Osceola takes his place beside him, but the double line does not stop. It divides and passes the two leaders. Then each line turns in, one inside the other, and they both circle the leaders and dance back in the direction from which they have come. About halfway back to the west position the lines again turn in on themselves and dance toward the two leaders. When the lines reach the leaders the rattles are shaken in the air and the movement ends with staccato whoops. This is repeated at each of the cardinal positions and the dance is over. It has lasted about 40 minutes.

The Feather Dance is danced four times in the course of the day. In 1946, it was danced at approximately 9 and 10 in the morning and twice in the afternoon. In 1949, owing to the delay in getting the bird and lack of preparation because of the uncertainty, the morning dances were delayed about an hour.

THE BLACK DRINKS

The taking of the Black Drinks follows the first dancing of the Feather Dance. Both infusions are drunk and both are rubbed on all parts of the body. Both are powerful emetics, so the system is completely emptied. This effect, however, does not take place in public. The men always seem to be able to reach a spot of privacy. If there is no Feather Dance, as is usually the case, the Black Drinks are taken earlier.

About noon is the big public meeting at the tchoc-ko thloc-ko. At all times during the Green Corn Dance, especially the last 2 days, there are men at the tchoc-ko thloc-ko. It is sort of a clubhouse where the men of all clans meet. At the big noon meeting on Court Day, however, all the men are present. The three or four elders who govern the group are all in the tchoc-ko thloc-ko. Others are sitting on the logs, and those for whom there is no more room, are standing by. All males are present even to small boys.

CRIME AND THE COURT

It is at this time that charges are brought against anyone who has committed a crime. The Seminole attitude toward crime is remarkably advanced. Briefly their attitude is this. It is to a man's advantage to belong to a social group, but he must pay for that advantage by conforming to the laws of that group. These laws are for the good of the group and therefore for the good of each individual of that group. And if a man breaks those laws he is acting against his own good. Therefore that man is not vicious—he is crazy.

Now a man who is crazy is a menace to the group. If, for example, he were to take the Black Drink with them, others might catch his craziness. He is, therefore, excluded from all rituals and ceremonies until such time as he may demonstrate that he has returned to a normal state of mind. No one forces him to his rehabilitation. It is a voluntary act on his part, and at any time he may withdraw. But in that case he remains an outlaw.

If he decides to regain his membership in society, he puts himself in the hands of the Medicine Man who takes him to some solitary place and puts him through a series of tests to break down his anti-social tendencies and demonstrate that he is willing to conform again. For example, the Medicine Man offers him a root of pa-sa and says, "You want to eat this"? If he says "No," the Medicine Man whips him. Then he says again, "You want to eat this"? If he says "No," he is whipped again. This is continued until he takes the root willingly and eats it, or until he refuses to go on with the test.

As another instance, the Medicine Man may prepare a little low hut and tell his patient to lie down in it and not move until he gets back. He goes away and may come back in 15 minutes or 3 days. He may even keep the man in the hut in sight all the time he is gone; but when the Medicine Man comes back, if there is any change of position or if he has seen the man move, the Medicine Man says, "All right. You move. You come out." And he whips him. But when at last the man obeys the Medicine Man in everything and without question, it is assumed that he has returned to sanity. He may now return to his normal life and take part in all the functions of the group.

If a man commits a serious crime and by his attitude shows there is no chance of reform, he is outlawed and may be killed by anyone—red, white, or black—and there will be no retaliation by the Indians. Or he may be killed out of hand. Society must be protected from him.

The incident of Charlie Emathla, just before the Seminole War flared in 1835, is an excellent example of this. The Government wanted the Indians to sell their cattle and move to Arkansas. The larger number of Indians, however, sparked particularly by Osceola and the young hotheads, had decided that no Indian must do it. If one did, he was promised a speedy and inevitable death.

Charlie Emathla, one of the older Indians, and one who was in favor of conciliation, did sell his cattle and was bringing his people in for transfer to the West, when they were met on the road by a delegation headed by Osceola. Charlie Emathla was killed and his body left for the wolves. The money for his cattle, which was found tied in a dirty handkerchief, Osceola threw into the bushes with the statement that it represented Indian blood. Charlie Emathla's skeleton lay there for 2 years until it was finally buried by the Whites. No Indian would touch it.

A recent case was that of Johnny Billy. He was executed by the tribe in 1938. On two different occasions, when drunk, he had killed a man. In each case the victim was a member of the Tiger Clan. Each time he was outlawed and turned over to the Tiger Clan for disposal. Both times the fact that he was drunk and not in possession of his senses was taken into consideration, and he was allowed to live because it was felt that he would reform and become a useful member of society; but he did not ask to be rehabilitated, and he remained an outlaw who could take no part in the ceremonies of the tribe. Finally, early in 1938, Johnny Billy beat a pregnant woman, and the Tiger Clan moved into action. The old men met and agreed that Johnny Billy had shown that he was now beyond the hope of reform and for the good of the tribe should be executed. This duty fell on the senior male member of the clan, John Osceola, 80 years old and almost a helpless invalid. His son, Billy Osceola, took him out to Big Cypress to see Cuffney Tiger, who was then Medicine Man. He told the Medicine Man what the Tiger Clan had decided, and Cuffney Tiger gave him some special tobacco to smoke when the execution was over so he would not go crazy. You will go crazy if you kill a man under whatever conditions, unless you take proper precautions afterward.

Jimmy Osceola now drove his father to the Musa Isle camp, where Johnny Billy was living. Jimmy helped his father out of the car, propped him against the car, and handed him his loaded shotgun. Then he went into the camp and summoned Johnny Billy. Johnny Billy knew well what was going to happen, but he walked straight up to the old man and took the shotgun charge in his chest. Jimmy helped the old man back in the car and drove him home, leaving the body of Johnny Billy for the White man to bury. No Indian would touch it.

John Osceola was driven home, where he sat on his chick-ee floor and smoked the Medicine tobacco, while members of the tribe brought him presents to show that they approved of what he had done. The White authorities took no action against John Osceola beyond a routine investigation that showed it was a case of tribal justice.

STATE OF THE NATION

Noon in the tchoc-ko thloc-ko on Court Day is also the time for formal discussion of problems that confront the group or the tribe. In 1946, for example, the subject that was vehemently discussed was a Creek Indian who had established himself at Dania as a missionary and was forbidding his converts to attend any tribal function.

Discussions at this time are formal. The speaker starts with the traditional address, "Staos"! (corresponding to "Ladies and Gentlemen"!) And his hearers signify agreement with an ejaculated "Ho!" or "Yes."

Influential members of the other groups are usually present at each Green Corn Dance—often the Medicine Man himself—and their opinion is always sought. Thus the idea of each group is carried to the others and the groups are kept in agreement.

COURT DAY AFTERNOON

The afternoon of Court Day has a less rigid schedule. More of the two cold Black Drinks may be brewed and the older of the young boys take them at the dance ground, drinking them and rubbing them on their legs and arms. They may then be scratched at the tchoc-ko thloc-ko—but lightly—and then they may eat. The 30-hour fast is considered too long for them.

The Feather Dance, if it is being danced that year, is danced twice in the afternoon. The Buffalo Dance is always danced. On Court Day afternoon it is quite usual to see one of the older men with a group of the very small children at the dance ground, teaching them one or the other of the dances. The children learn the dances early, and most of the day and early evening dances (except the Feather Dance) have youngsters of 4 or 5 bringing up the tail end.

The men are likely to do quite a bit of sleeping in the afternoon when no official dancing is in progress. The women are doing some cooking, for they can eat, and they also prepare food for the boys who have completed their ritual. Between 4:30 and 6 in the evening, the men march out with axes and begin chopping wood for the dance fire. Scattered here and there, not too far from the dance ground, are dead pines standing, and down timber, and these are chopped into lengths suitable for carrying. The men bring these in, marching single file and singing, their shoulders protected by palmetto fans. The Medicine Man stands by and directs the piling, sending them back for load after load until he thinks enough has been piled to the north of the dance fire, to last the full night of dancing.

Sometimes the ball game is played before the wood is brought in, sometimes after. There seems to be no exact rule. The ball game usually starts with some of the boys gathering at the vacant dance ground and throwing the ball at the pole. They are joined by older boys with rackets who begin practicing. Then some of the smaller girls join in. Pretty soon some of the older girls drift down from the clan camps. And before you know it, a full-fledged ball game is in progress with a scorekeeper standing by the pole and two mixed groups of boys and girls swinging around the pole and playing in deadly earnest.

In the meantime, in the clan camps, the women are dressing for the big event—combing their hair over the great disks of cardboard in the current fashion, fixing their leg rattles, and putting on their newest and brightest finery.

In the past 15 years there has been a marked decrease in the number of the older women who take part in the actual dancing. But it is very important for the young, marriageable girls to take part, both in the dancing and in the ball game. They are at their glamorous peak—the boys the most susceptible. And there is no question that the physical contact and excitement of the ball game is a matrimonial incentive.

The older men, of course, are an essential part of the dance. Without them it would be impossible. They know the routine, and the songs and it is necessary for one of them either to lead the dance or, in the case of the more intricate dances, to direct from a seat on the log to the east of the fire, between it and the dance path circle. More than anyone else, they realize the importance of taking part in the rituals, and there is always a good leavening of the older men in every dance.

It is interesting to notice that in the years when there is a great predominance of young, inexperienced dancers, few of the difficult dances are called, and the program is an almost unbroken sequence of "Just Dance," a dance of a simple double step with the song extemporaneous on the part of the leader.

Shortly before 7 o'clock the women in the clan camps have their evening meal. Some of the men are in the tchoc-ko thloc-ko talking, others are in the camps sleeping or visiting. Some may even be undergoing the scratching, if they are unable to take part in the ritual the next morning.

THE LAST NIGHT

About twilight, the Medicine Man and his assistant begin preparing the place to the east of the dance circle where they will sit out the night. They clear off all grass, level the ground, and finally sweep it with branches.

The poles for the sweat bath, two long, limber saplings, are brought in by the Medicine Man's helpers unless they are available from the previous year. These are put down near the pole where the Medicine hangs.

A fire is now laid for the Medicine Man. This is hil-eesh-wa (medicine) en-tot-ka (fire) (Creek); ai-yicks-chee (medicine) eet-ka-hee (fire) (Miccosuki). This Miccosuki radical for "fire" is used only for the Medicine Fire. The usual fire radical is ee-mee-tee. Four logs, one side round and one split off square, each about 3 feet long and 6 inches in diameter, are laid parallel in front of the Medicine Man's place, making a square. Kindlings of lightwood about half an inch thick are laid handy.

In the meantime, the Medicine Man's assistant has gone over to the Medicine Bundle. He stands in front of it about 2 feet away. The movement of his shoulders shows that he is lifting his hands repeatedly as though addressing the Medicine. He steps nearer and repeats his actions. Then he takes a little buckskin package out of the bundle and carries it over to the newly laid fire. It is the fire flint. It is opened and the boys proceed to start the fire with it. Suddenly there is a little column of smoke and then a spread. One of the boys fans it with his hat. Lightwood is added, and the Medicine Fire is going. The flint is done up again in its package and it is placed against the logs on the east side of the fire.

The Medicine Man's assistant goes back to the Medicine Bundle where it hangs on the stake, and stands about 3 feet in front of it. Every now and then he bows his head in a slow nod. His shoulders lift as though he were lifting his hands to his mouth. He turns and spits as though he were spitting out seeds or something. He steps nearer and repeats his actions. He seems to be either praying or addressing the Medicine. My impression is that he is doing the latter. He then lifts the Medicine Bundle off the stake and brings it to the fire, putting it about 4 feet east of the fire on a cloth that has been spread for it.

The thong which was tied around the legs of the deerskin and by which it was hung on the stake is taken off and the deerskin gradually opened, the Medicine Man's assistant kneeling in front of it and doing the opening, while the Medicine Man stands by. The fire-making stone is put back in.

The assistant goes off in the direction of the camp of the Little Bird Clan. The Medicine Man opens the cloth he is holding. It is about 5 or 6 feet square, dark gray from use. He folds it over once and spreads it between the Medicine and the fire. It is for the Medicine Man and his assistants to sit on. He will sit there all night long between his two brothers.

The Medicine Man's assistant comes back from the Deer Clan camp, the opposite direction from that in which he left. He has made a round of the camps and has collected the private Medicine of various Indians in the camps. This is put, not in the deerskin, but just in front of it and against it. Each Medicine is in a little bundle. The tribal Medicine is now in the deerskin, half of which is on the ground and the other half turned over and covering the Medicine, the open side toward the fire. Later it will be covered with a small tarp, but lightly so that the deerskin and the bundles can be seen.

The two helpers bring up white-enameled pails and put them on the dance circle side of the fire with cups to drink from. They also bring up some bundles of pa-sa and put them by the pails, and a handful of palmetto fronds and a prayer reed wound with red cloth. These are put on the dance-circle side of the fire with the pails and cups.

The Medicine Man leaves the dance circle for a little time. When he returns he has another tarpaulin and a little white-cloth bag. My guess is that this is the "white root" [3] that comes from Oklahoma and is a necessary ingredient in the third Black Drink that is about to be mixed. This is the one element that the helpers do not find, and in a moment they will bring up the rest of the ingredients.

Nahaw Tiger and some of the others have come down to the dance ground from the clan camps with their private Medicine, and are standing by the Medicine Man's fire. The helpers take this Medicine and put it with the other private Medicine against the Medicine Bundle. The Medicine Man puts all the private Medicine inside the Bundle and sits down.

Now the helpers bring up the ingredients for the third Black Drink which they have previously collected. These are arranged against the logs of the Medicine Fire on the side toward the Medicine Man. They include willow roots, the inner bark of which will be used as in the earlier cold Black Drink, and pa-sa, from which Black Drink No. 1 was made.

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[3] From a recent description I had of this root I am sure it is ginseng.—L. C.

THE BIG POT DRINK

This is the boiled Black Drink—ah-lish (pot) thloc-ko (big) ish-kee-ta (drink) (Cow Creek); ai-yicks (medicine) ta-na-kee-kee (all kinds together) (Miccosuki). It is the preventive medicine for most of the diseases to which the Indian is subject, with the emphasis on those which the Medicine Man thinks are the greatest menace that particular year. There are 14 or 15 different ingredients. These are gathered during the early days of the dance by the helpers, and the number used depends on their ability to find the proper herbs. Josie Billy, former Medicine Man, said that the boys now do not know all of them and don't find them.

This Black Drink boils until midnight and then it is taken four times. It is swallowed but must not be retained. If it does not come up naturally, the Indian must force himself to vomit. The last of this last Black Drink is emptied on the sweat-bath stones the next morning. Of course, many of the ingredients disintegrate in the boiling, but woody structures and some leaves persist. A classification of the ingredients left intact at the Cow Creek dance in 1949 showed six distinct shrubs, as follows:

(1) St. John's wort (*Hypericum aspalathoides*)—wee-ah-ko-chee (Cow Creek), a-posh-shee-ka-yee (Miccosuki).
(2) Red bay (*Persea borbonia*)—too-la (Cow Creek), too-lee (Miccosuki).
(3) Blueberry (*Vaccinium myrsinites*)—tsa-fuck-in-a (Cow Creek), o-luck-ee (Miccosuki).

And three of the grape family:

(4) *Cissus sicyoides*—chu-los sho-a-kee (Cow Creek), tsuk-ko-chee (Miccosuki).
(5) *Vitis rotundifolia*—so-losh-ka (Cow Creek), tsuk-ko-chee (Miccosuki).
(6) *Vitis caribaea.*

Other medicines that may be used are:

Sweet bay (*Magnolia virginiana*)—too-la hat-ka (Cow Creek), too-lat-kee (Miccosuki). (Note that both languages use the name for red bay plus the radical for white.)
Rabbit tobacco (*Pterocaulon undulatum*).

There is also used a root that does not grow in Florida but has to be brought from Oklahoma. It is known in each language as "White Medicine"—hil-eesh hat-kee (Cow Creek), ai-yicks hat-kee (Miccosuki). I am convinced this is ginseng.

DANCE ALL NIGHT

It is almost dark. The Medicine Man and his assistants are taking the earlier Black Drink from the pails and rubbing it on themselves; so are some of the other men. The Medicine Man and his two assistants go back of the Medicine Man's fire and sit down. It is now about 8 o'clock. A few minutes later the men go to the tchoc-ko thloc-ko and sit down. Shortly, the dance begins.

On this last night, the dancing will go on until morning. The Medicine Man has little sticks of wood, a little longer and a little thinner than match sticks. With these he keeps track of the dancing, sticking one in the ground for each dance and arranging them in orderly rows in front of him. By morning he has quite an array of them.

Up to midnight, the dances are the usual "fun" dances. At midnight the boiled Black Drink is taken again and again until it has been taken four times. The effects are not visible, because they take place in the darkness back of the Medicine Man and to the east of the dance fire. At midnight the Green Corn Dance itself is danced for the first time. It is repeated several times before morning, interlarded with the various "fun" dances.

This is the chant for the Green Corn Dance, sung for me in 1936 by Ben Tommie, whom I have seen lead it several times. Each line is sung first by the leader as he dances, and then repeated by the dancers:

Song of the Green Corn Dance

Yo-eeyo-o
Yo-eeyo-o
He-wao-hui
He-wao-hui
Who-he
Who-he
We-he-who-he
We-he-who-he
O-he-ya
O-he-ya
Yo-we-ya
Yo-we-ya
O-he-ya
O-he-ya
Yo-we-he-ya
Yo-we-he-ya
Wa-he-yo-a
Wa-he-yo-a
Yea-he-yea
Yea-he-yea
Yeo-ho-yeo
Yeo-ho-yeo
Wa-he-yeo-a
Wa-he-yeo-a
He-eeyo
He-eeyo
Ha-he-ya
Ha-he-ya

I asked Ben Tommie what the words meant. He thought they "didn't mean anything." They had been taught him by Sam Jones, the Medicine Man. In 1949, I read these words to Josie Billy, the ex-Medicine Man. He said the words were wrong and sang me another version. In neither version were any regular Seminole radicals involved. He said they did mean something, but that they were in a language now forgotten.

There is no question that, whether he knows what the words mean or not, the Seminole feels that the dance and the song are an invocation to God to protect the health of the Indian during the coming year and to strengthen the life in the Medicine. I once asked an Indian about the song. He said, "I dunno what the words say, but it make my heart feel good." And there, of course, is the secret, you might say—the secret of all religion.

It is very difficult to identify actual word radicals in Indian songs, or, at least, I have found it so with the Seminole songs. If you ask an Indian while a song is going on, "What are they saying?" his answer usually is, "Not sayin' anything—singin'." There seems to be a distinct difference between the language of the spoken word and the language of song. In the case of the Green Corn Dance song, I have yet to find an Indian who will admit knowing what the words of the song say. They all have a general idea of the meaning of the song, but its exact word meaning is something else again. A logical explanation the Indian offers is that it is in an old language now forgotten, and that when it was new the Indian did know what it said.

THE SCENE AT MIDNIGHT

The Green Corn Dance has reached its climax. But unless it is possible to evoke some of the feeling and some of the emotion of these last few hours, there is no true picture of the dance. The night is not black unless your eyes are blinded by the brilliance of the dance fire. A short distance away, the sky is gleaming with stars. The sky lightens toward the horizon line with the earth black against it, ragged here and there with trees. Back in the clan camps, fires burn low and an occasional lantern glows dully. Now and then a figure moves in the half darkness.

But the life of the tribe is centered around the dance fire which crackles and flares and sends sparks high in the air when new logs are thrown on it. It lights the brilliant figures dancing on the opposite side and throws those on the nearer side into sharp silhouette. It shines on the faces of the men sitting in the tchoc-ko thloc-ko and on the long log to the north. Augmented by his own fire, it lights the Medicine Man and his assistants sitting cross-legged behind their fire to the east of the dance circle.

In preparation for this night the men's bodies have been cleansed and purified. For 24 hours they have fasted and taken the powerful Black Drinks. Since daylight of the morning before, the sacred

Medicine, hidden during all the rest of the year, has been out, and now it lies in its deerskin back of the Medicine Man gathering power.

This Medicine shows God's love for the Seminole. It is his gift and holds within itself all that is needful for the good of the Seminole. It has belonged to the Seminole since there was first a Seminole on earth—God gave it to him just after he came up out of the ground. And just as he is doing now, his ancestors have done since the beginning—the same songs, the same dances, the same ritual, to keep the life and power in the Medicine.

And on this night, es-te fas-ta is certainly near, hovering above with new Medicine to put in the bundle if God thinks the Seminole needs it. It is a night of power and forces, which can be felt, and each individual is part of it.

THE FINAL MORNING

Toward morning the dancers begin to tire and the efforts of the dance boss to whip up enthusiasm and keep life in the dancing become, of necessity, more and more strenuous. Here is where the qualities of firmness, leadership, and a good sense of humor really count. I remember one year, however, when there were a great many Indians present from the Trail and Big Cypress groups, and the dancing ended in a blaze of glory. Some of the older men began bringing up the old-time and rarely used dances, and a real competition set in as one after another demanded the chance to lead some particular specialty. Everyone got in the spirit of it and the dancing lasted so late that the whole ritual was thrown out of timing.

As the first streaks of gray show in the east, the women leave the dance ground and go back to the clan camps where they begin the preparation of the feast. The actual preparation has begun previously with the grinding of the corn. This is no longer done with the hollow log and the pounding stick. The soft corn is removed from the cob and ground coarsely in a hand mill, like the old mill used for coffee, or on farms for grinding oyster shells. The hard corn is ground the same way and then winnowed in a great, round, flat basket-tray to remove the chaff. It is picked over carefully and unwanted parts pulled off with the fingernails and discarded.

The ritualistic part of the food is, of course, the corn. This is prepared as boiled ears; as sof-kee, a thin gruel of grits, the traditional drink of the Seminole; and as great biscuit, 8 to 12 inches across, made by mixing the corn with white flour, salt, baking powder, and water, and frying it in an iron skillet, spooning the hot grease over it as it bakes.

Meat is also part of the feast. This is recooked beef. Since the Indian has no refrigeration, the matter of keeping meat when he kills a whole animal is a problem. Some meat is jerked—that is, dried in the sun. This is not very satisfactory. Florida has anything but the dry, preserving climate of the Southwest. The best solution is to remove the fat and cut the lean meat into cubes about 3 inches in size. These are run on a spear of green palmetto and cooked hard and dry. This meat may be eaten as it is, in which case it is served with a pan of hot grease in which it is dipped as eaten, to soften it and give it flavor. It will keep for weeks in even the warmest weather.

But for feasts such as the Corn Dance, it is cooked up with rice and tomatoes, which softens it, and which gives richness to the vegetables. It is eaten with a spoon. Coffee is another essential. Boiled in little, black, iron kettles, it is served with sugar only.

When the women have left the dance ground, the final purification ceremonies begin. Practically all the men are scarified at this time, the only exception being those who were "scratched" the day before. The scratching is usually of the outer skin only; deep enough to leave marks that scab over and last for weeks, but not deep enough to cause a flow of blood. The scratching may be deep, however, in which case it is usually a younger man. The scratching is being done by one of the younger bucks, and there is a good deal of laughter and banter. It is evident that he is being punished for some failure to measure up to standard.

THE SCRATCHING

The scratching consists of two long strokes on the front and two on the back of each upper arm and each lower arm; two front and two back on the thighs and two each on the lower leg; two diagonal strokes on each breast and two diagonal strokes on each side of the back. The man being scratched, of course, takes it voluntarily, but he may wince and give yi's and yip's of appreciation as he feels the needles. It is all good natured, however, and there is quite a bit of banter. All this exuberance and all such acknowledgment of pain are on the part of the younger men. The older men take it quite as a matter of course and with quiet seriousness.

For the scratching the men wear only some sort of a breechclout—usually a shirt twisted through their legs and around their waists. The scratching is done simultaneously by six or eight men, the older men scratching the older and the younger, the younger. The Medicine Man and his assistants, as well as the helpers, are all scratched at this time. In fact, every man not yet scratched is scratched at this time, the helpers being sent out to bring in the laggards. A man too drunk to walk is carried, one on each side, to the dance ground; his clothes are taken off and he is scratched whether or no. In such a case, the scratching seems to have quite a sobering effect.

The scratching on this last morning is not done at the tchoc-ko thloc-ko, but on the opposite side of the dance fire. Its purpose is to purify the blood and prevent blood poison. No sanitary or prophylactic measures are taken and the needles are used on one after another. But I have never seen any infection develop, local or systemic.

In the meantime the sweat bath has been prepared to the northeast of the Medicine Man's fire. Directly to the east of the Medicine Man's fire, the stones are heating on the sweat-bath fire—four stones about 10 inches across, of a lime conglomerate. The two long poles for the sweat bath have been provided the day before, or those from the previous year are used again. They are bent across each other in an arc and a tarpaulin is thrown over them, making a hemisphere about 8 feet in diameter, and about 4 feet high.

As mentioned previously, the sweat-bath stones are called sa-too (stone) hi-yee (hot) (Creek); tal-lee (stone) hi-yee (hot) (Miccosuki). The term for sweat bath adds the word for house—sa-too hi-yee tchoc-ko (Creek) and tal-lee hi-yee chick-kee (Miccosuki). The term for sweat is also used—ish-mish-kee-ta (Creek), hip-kit-kee-kee (Miccosuki). This works out sa-too tut-ka ish-mish-kee-ta (Creek) and tal-lee hi-yee hip-kit-kee-kee (Miccosuki). It will be noted that my Cow Creek informant in this case used a different word for hot.

Fifteen or twenty of the men crowd in this small space, clad in their makeshift breechclouts. They are mostly the younger men. The four heated stones are now handed in, and all the remaining Black Drink, and this last is emptied on the stones. In a moment steam curls out of all leaks in the covering, the walls billow as the men move about, and there is much laughter and talk inside the little tent. The men stay inside for about 3 or 4 minutes, and then they burst out, glistening with sweat, and make for the marsh to bathe. Those who have not taken the sweat bath also go and bathe, and for some time there is a continual procession of men on their way from the dance ground to the marsh and returning.

In the meantime, the Medicine Man has taken a little red cloth package from the Medicine Bundle and from this has taken a little pipe. He lights this and stands, facing the east and smoking it. He stands thus for a few moments, smoking, and then he sits down behind the Medicine Man's fire, facing west, and smokes for a few minutes more. Then he puts up the pipe and turns to the Medicine Bundle.

He is now squatted down before the Medicine Bundle facing east. One by one he opens the little buckskin packages and inspects their contents. It is now he will discover whether es-te fas-ta has given him new Medicine. He will find it as he goes through the packages. Indians drift up and stand by for a while watching him, and then move away, but at all times there are several standing by. As he comes to any of the private Medicine, he hands it up to the owner, who takes it at once to his camp and puts it back where he keeps it.

When he has finished, the Medicine Man wraps the Medicine in a different deerskin. The deerskin in which it has been for the last 24 hours is spread on top of the tchoc-ko thloc-ko. The Medicine Man now takes the Medicine Bundle and walks off to the east until he disappears in the distance.

The men, as they finish their various occupations, go and sit in the tchoc-ko thloc-ko, on the logs facing inward. The women in long, brightly colored, single-file processions, bring the food down from the various clan camps to the dance ground, setting it down at the foot of the paths through the palmettos. The men bring it in from there and put it in the open space between the log seats of the tchoc-ko thloc-ko. The Medicine Man's assistant stands by the ball-game pole just outside of the dance circle. Properly timed it should be just sunrise and everything awaits the return of the Medicine Man.

At last his assistant sights the Medicine Man returning empty-handed. He has hidden the Medicine Bundle. The assistant gives the signal and the feast begins. The Green Corn Dance is over.

EXPLANATION OF PLATES

PLATE 7

Typical Seminole Village

Home of Sam Jones, Medicine Man of the Cow Creek Seminoles. In the center, between the houses, is the cooking shelter roofed with sheet iron. It is the center of the circle of sleeping houses. This is a typical village of the pine prairies.

PLATE 8

Two Seminole Medicine Men

Left: Ingraham Billy, Medicine Man of the Tamiami Trail Seminole. *Right:* Sam Jones, long-time Medicine Man of the Cow Creek Seminole.

PLATE 9

Two Seminole Medicine Men

Left: John Osceola, Big Cypress Medicine Man at the 1949 Green Corn Dance. He held the Medicine Bundle only a few months, and turned it over recently to his son-in-law, Frank Tucker. *Right:* Josie Billy, former Medicine Man of the Tamiami Trail Seminole.

PLATE 10

Clan Camp at the Green Corn Dance

Upper: Occupied clan camp; for the 5 or 6 days of the Green Corn Dance, tarpaulins are stretched over ridge poles, floors are laid down, temporary shelters are put up, and the camp is a living thing. *Lower:* Clan camp between Corn Dances; for the rest of the year only bare pole frameworks remain, though floors are left in some instances.

PLATE 11

Setting for the Green Corn Dance

Upper: The dance circle. To the left is the ball-game pole; center, the log for the dance director; right center, the dance fire; right, the tchoc-ko thloc-ko. In the back are the deserted clan camps. *Lower:* Sweat-bath stones and framework. A tarpaulin covers the framework the last morning of the Green Corn Dance. Fifteen or twenty men squat inside and the last of the Black Drink is poured on the four hot stones.

PLATE 12

Views of the Green Corn Dance Structure

Upper: The tchoc-ko thloc-ko, or "Big House"—MacCauley's "House Where the Warriors Sit." His term shows his informant was Cow Creek. The Miccosuki word is chick-ee cho-bee, which also means "Big House." Looking east through the structure, the dance fire is clearly marked. The uprights are 8-inch pine logs. The over-all ground measurements are approximately 10 by 14 feet, with a 2-foot overhang of the thatching. In front it is 6 feet 7 inches to the cross beam; in back, 5 feet 8 inches. Seven smaller logs are crossways of the main beams, with light poles across them. The thatching is palmetto, held in place by four logs laid lengthwise, The roof is further decorated with branches of sweet bay. The light poles laid loosely on top are the poles from the Feather Dance. *Lower:* Reserved seats for the Green Corn Dance. The floor arrangement of the tchoc-ko thloc-ko. The men sit on the double logs front and back. Both rows face east during the dancing and ball games. Both rows face inward on picnic day and for the feast the last morning. The food is placed down the center. The men also face inward for the discussions on Court Day.

PLATE 13

Green Corn Dance Items

To the left are the roots, stems, and fruits of the pa-sa. The tubers have been removed for the first Black Drink. Next is the willow log from which the inner bark has been removed to make the second black drink, ac-wa-na. The outer bark of the willow as it was stripped off is in front. To the right of the yardstick is the hollow prayer reed with its windings of red cloth. Next is a well-made ball-game racket, and last a makeshift racket of split palmetto stem. Below are tin-can rattles—those on the left are women's rattles, and those on the right, men's.

PLATE 14

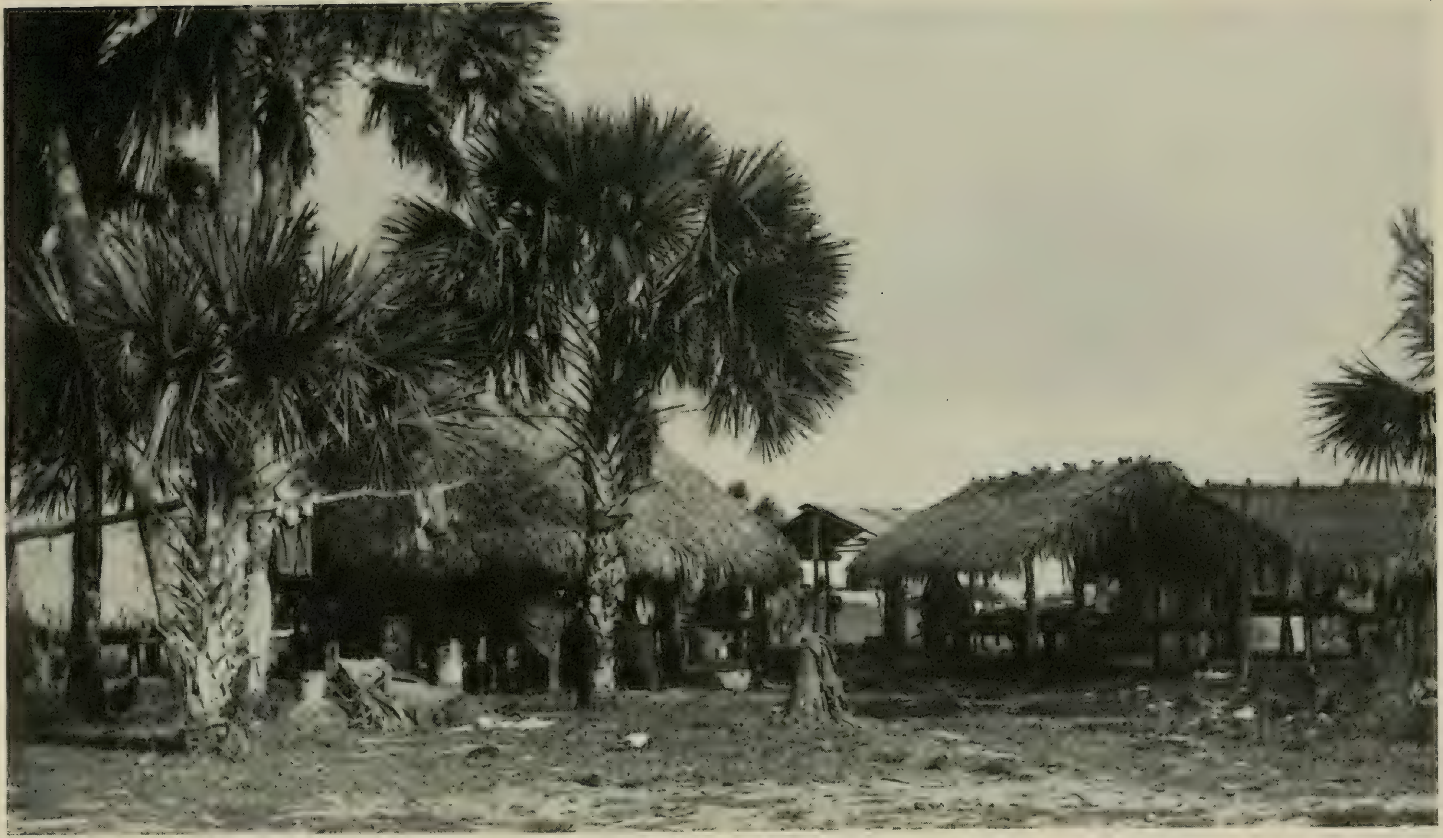
Plants Used in Preparation of the Black Drink

Left: Herbs from the Black Drink. Woody parts of herbs remaining from the "Big Pot" Black Drink. Top row, left to right: 1, St. John's wort, *Hypericum aspalathoides* Willd.; 2, Water liana, *Cissus sicyoides* L.; *second row:* 3, blueberry, *Vaccinium myrsinites* Lam.; 4, Grapes, *Vitis rotundifolia* Mich., and *Vitis caribaea* H. & B.; 5, Red bay, *Persea borbonia* (L.) Spreng. *Right:* Black Drink herbs and prayer reed. The sweat-bath stones covered with the woody parts of the herbs in the "Big Pot" Black Drink. Leaning against them is the hollow reed wound with red cloth through which prayers have been blown into the Black Drink.

Plate 15

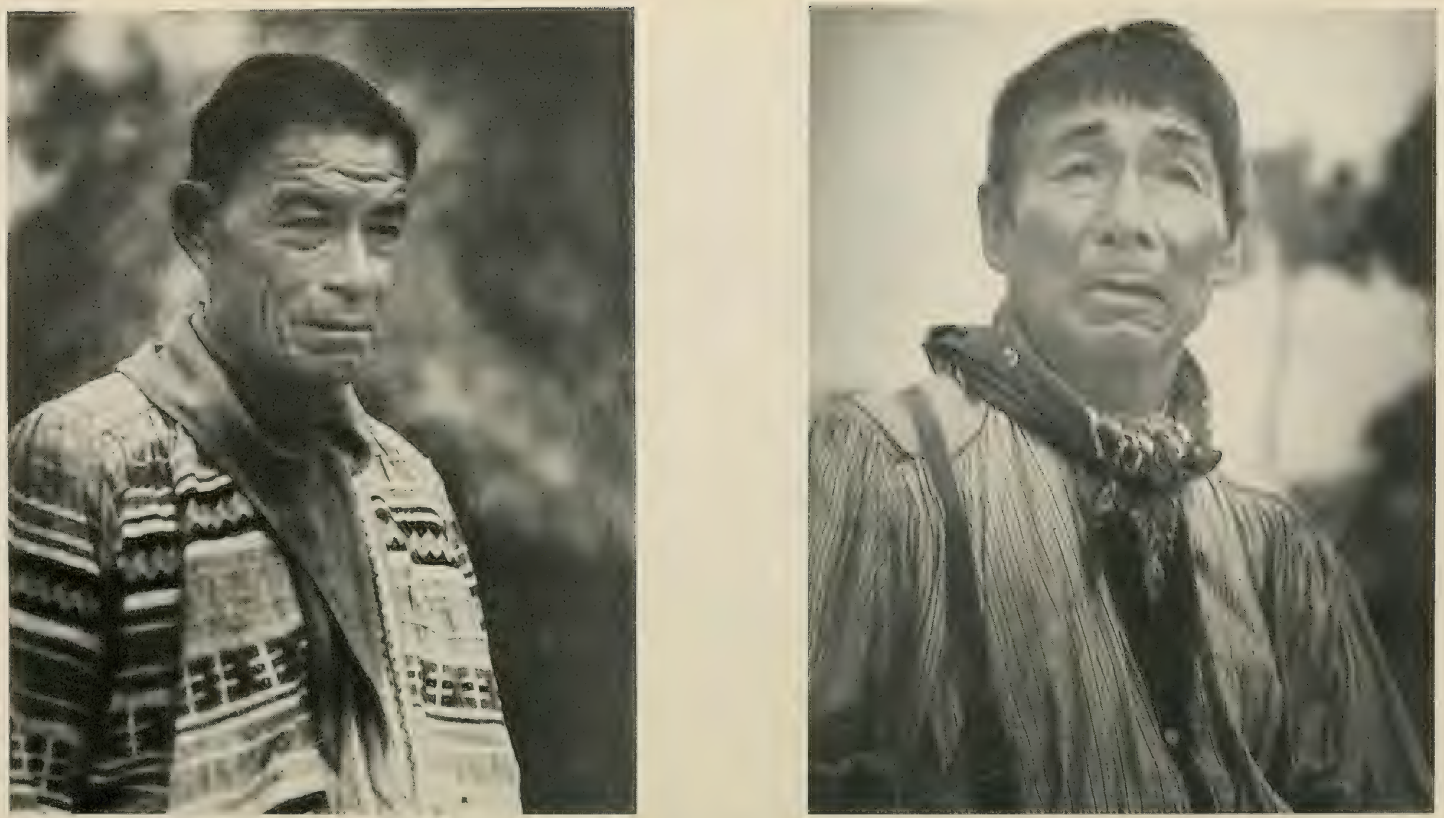
Items Used in the Green Corn Dance

a, Scratcher. Six needles run through a small block of wood and bound with thread, with which the men are scratched to purify the blood. *b*, Forked Medicine stick. On this forked branch, firmly set in the ground, the sacred Medicine hangs in its deerskin from early in the morning of Court Day until evening, when it is taken down to be watched over by the Medicine Man the whole night of dancing. *c*, Score board. Flattened side of the ball-game pole on which the score is kept with a piece of charcoal.



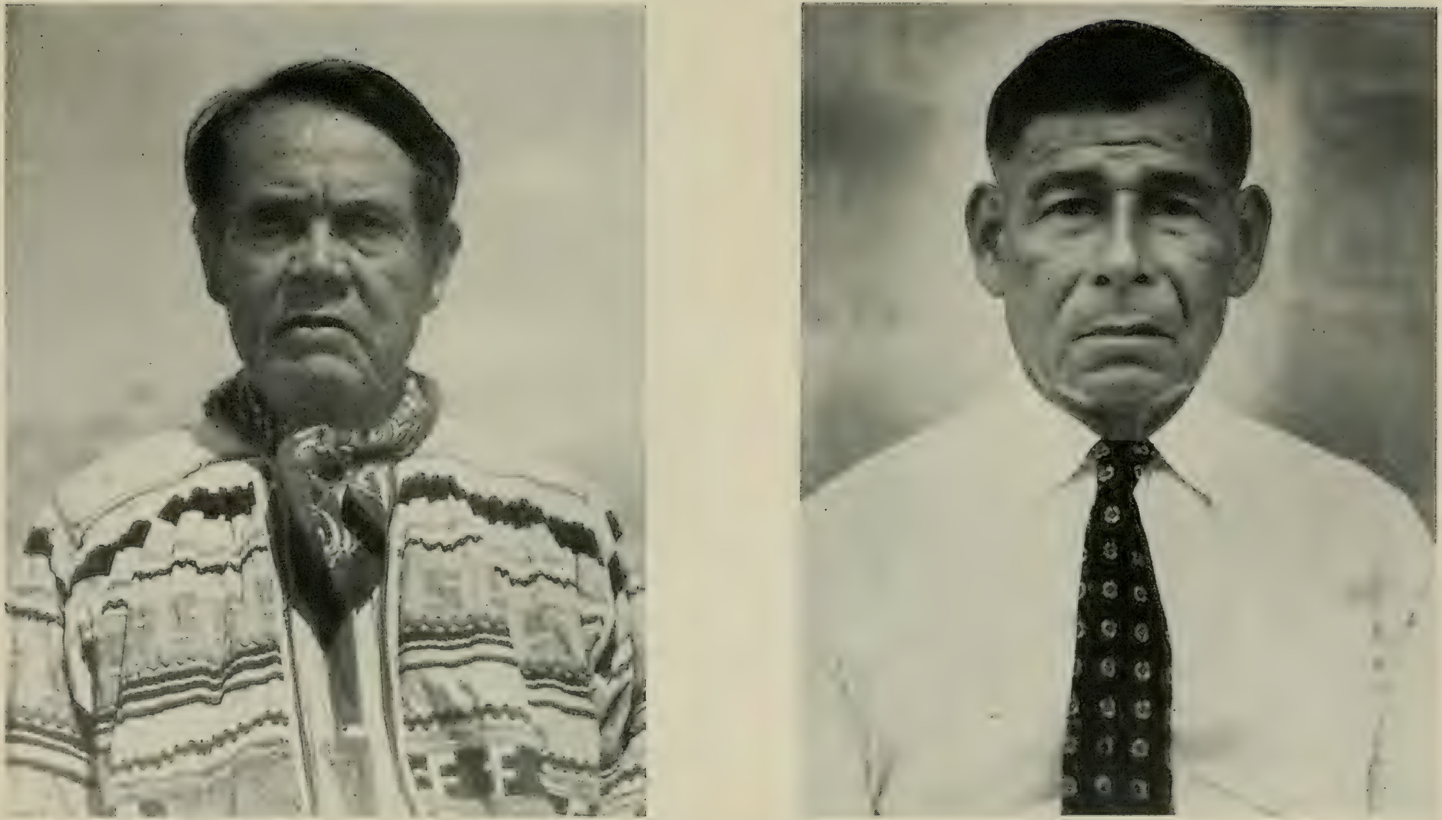
TYPICAL SEMINOLE VILLAGE.

(For explanation, see p. 208.)



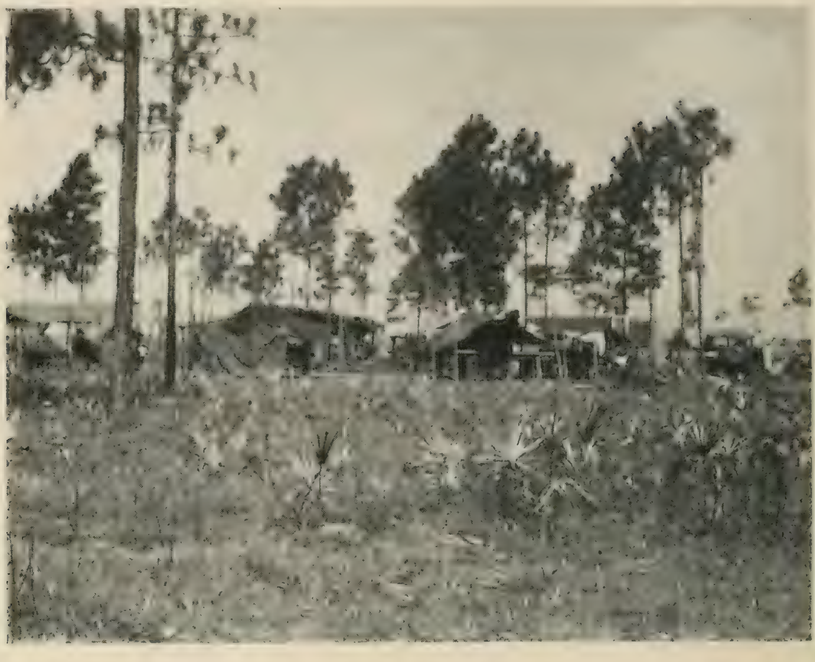
TWO SEMINOLE MEDICINE MEN.

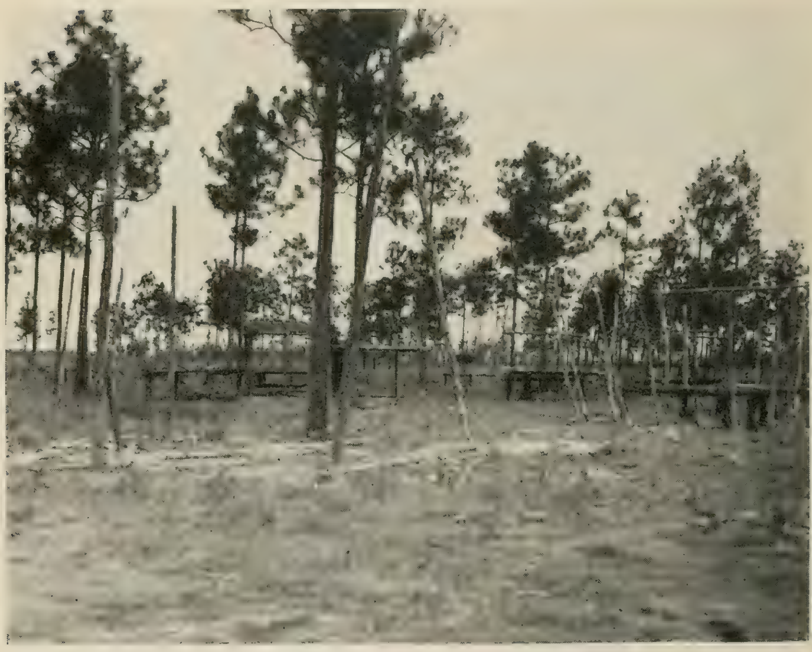
(For explanation, see p. 208.)



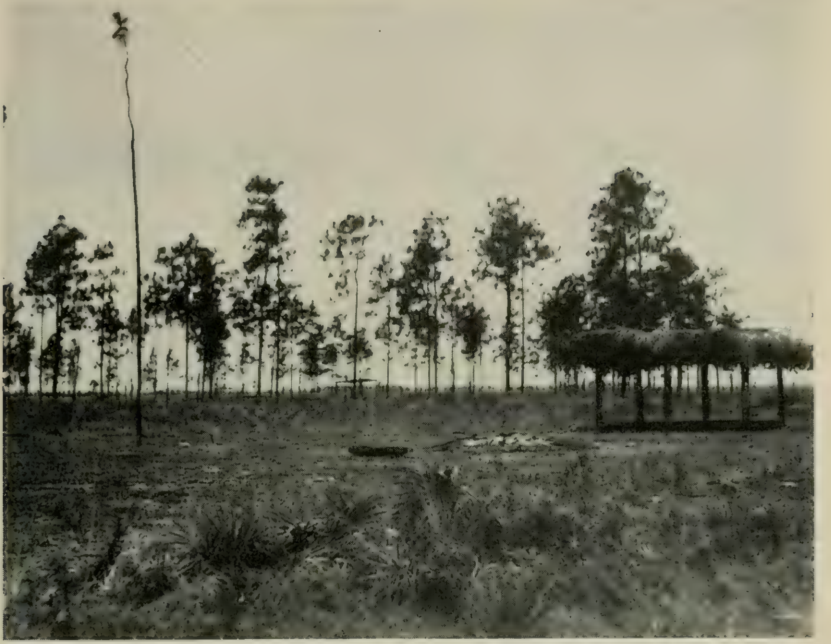
Two Seminole Medicine Men.

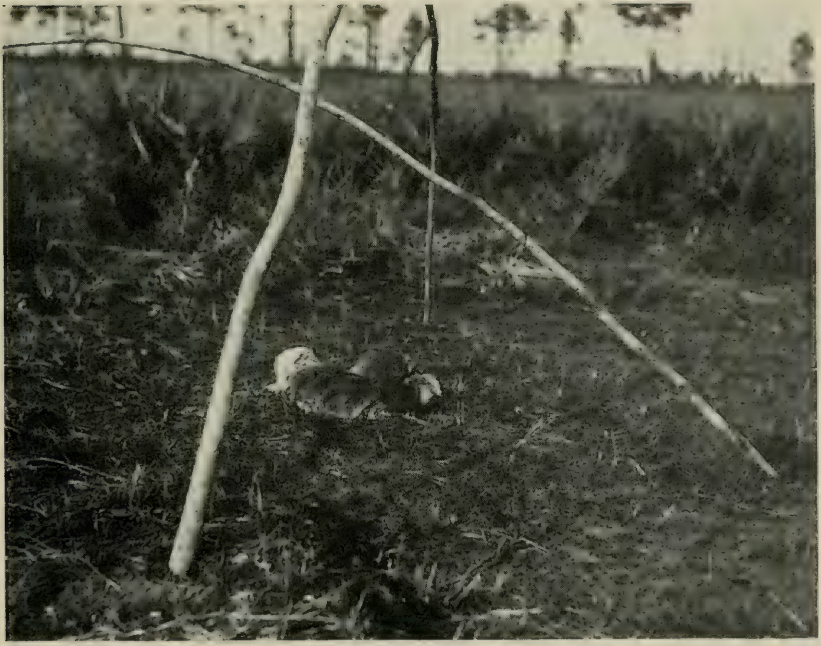
(For explanation, see p. 208.)



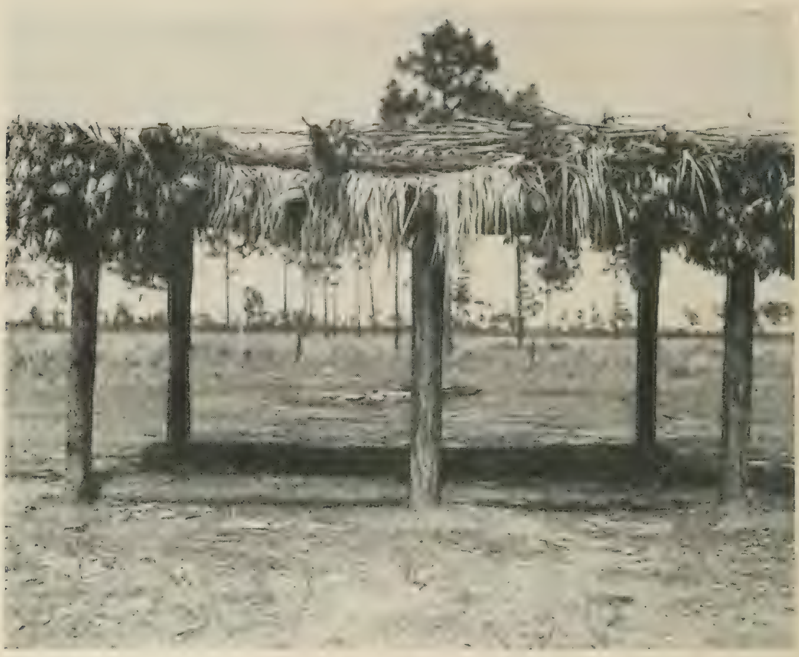


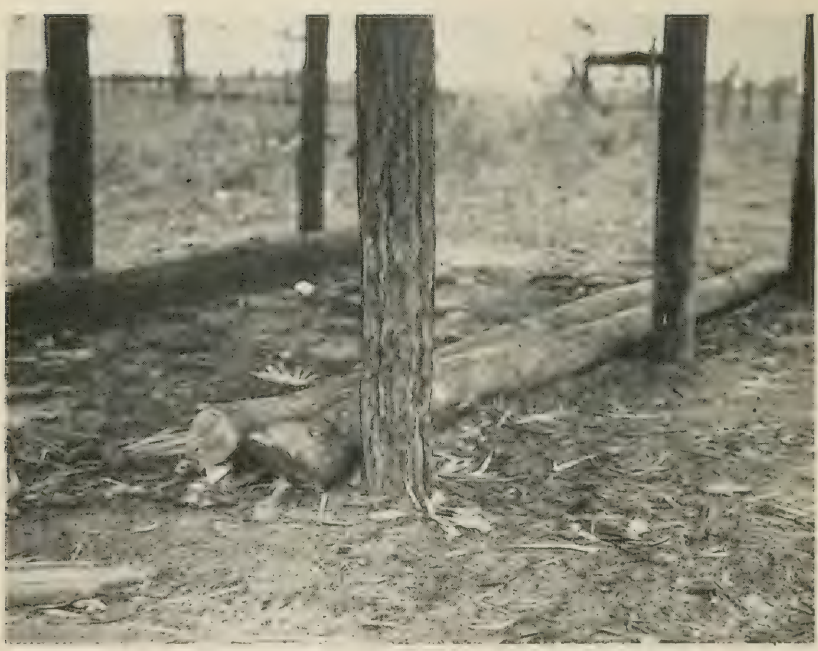
CLAN CAMP AT THE GREEN CORN DANCE.
(For explanation, see p. 208.)





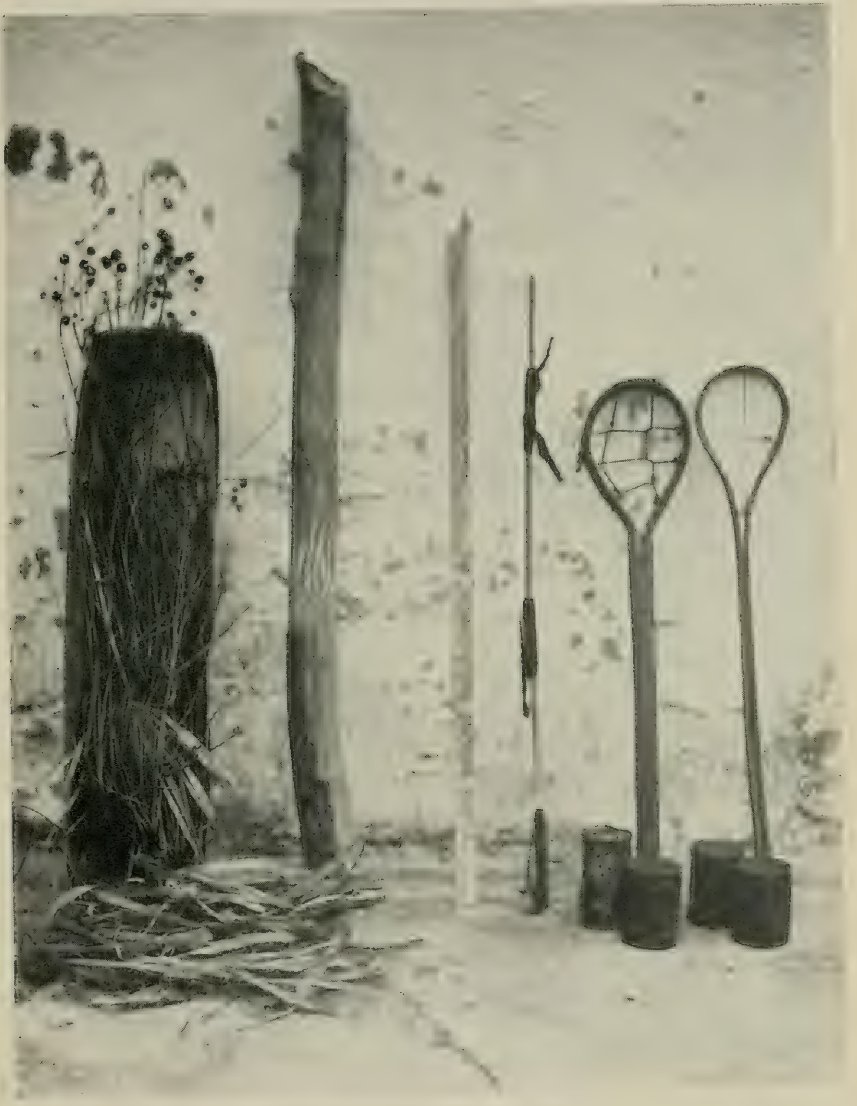
SETTING FOR THE GREEN CORN DANCE.
(For explanation, see p. 209.)





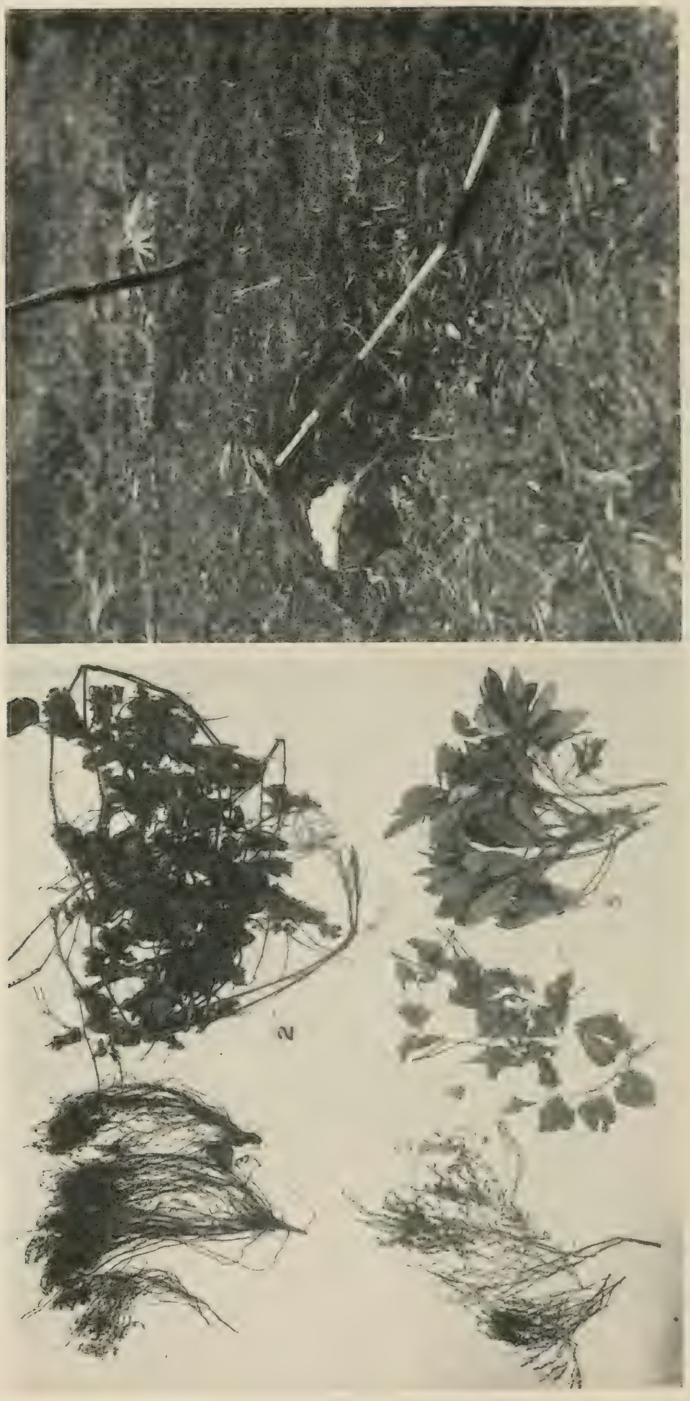
VIEWS OF THE GREEN CORN DANCE STRUCTURE.

(For explanation, see p. 209.)



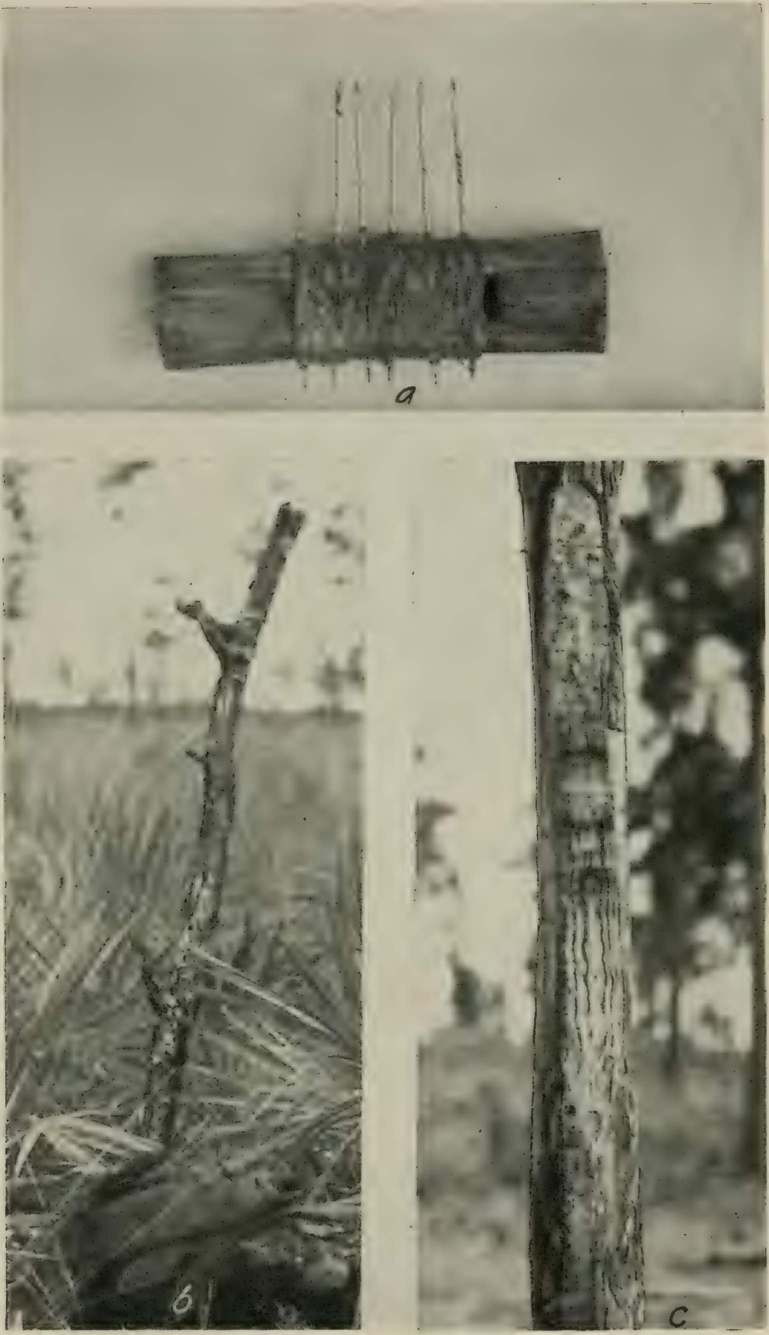
GREEN CORN DANCE ITEMS.

(For explanation, see p. 209.)



PLANTS USED IN PREPARATION OF THE BLACK DRINK.

(For explanation, see p. 209.)



ITEMS USED IN THE GREEN CORN DANCE.

(For explanation, see p. 210.)

SMITHSONIAN INSTITUTION
Bureau of American Ethnology
Bulletin 151

Anthropological Papers, No. 36

Technique in the Music of the American Indian

By FRANCES DENSMORE

TECHNIQUE IN THE MUSIC OF THE AMERICAN INDIAN

By Frances Densmore

Music should be recognized as a phase of the culture of the American Indian. When this is done we are ready to look for standards of excellence as in other phases of culture. These are not found as easily in music as in such arts as pottery and basketry. The Indians cannot describe their music in detail and little beyond a general knowledge is gained by listening to the singing at ceremonies, games, and dances. Information must be gained by patient investigation and the Indian often tells a great deal when he is unconscious that he is giving important facts.

The present consideration will be limited to technique in the singing of the Indians except when the tempo of the song is different from that of the accompanying instrument. An interesting study could be made of the Indian technique in drumming and the use of other percussion instruments, as well as the more primitive forms of accompaniment, such as clapping the hands. These, as well as whistles and other wind instruments, are familiar to students of Indian music.

The following are phases of technique that are common to many tribes:

Tone production.—The Indian produces his singing tone by a peculiar action of the muscles of his mouth and throat. The writer once sang a Chippewa song for Maiñ'gans who had recorded it and asked him if it was correct. He replied, "The tune is right but you haven't an Indian *throat*." That is the fundamental element in the old Indian singing and cannot be imitated successfully by a white person, neither is it heard in the singing of young, educated Indians. By the use of this peculiar technique an Indian could separate the tones of his song without the use of words or syllables. He could produce note values as short as 32d notes with distinctness. Among the old Chippewa a peculiar, artificial tone was used in love songs and in no other songs except those of the scalp dance. It is a nasal, whining tone, with a gliding from one pitch to another, and the old love songs can be recognized by this mannerism. It has been compared to the sound produced by an animal and also to an imitation of the sound of a wind instrument. The writer recorded numerous love songs prior to 1911 that were sung with this technique, by both men and women.

A different tone production is used by men who sing around the drum at dances. Theirs is a piercing quality of tone that can be heard a long distance. A similar quality of tone is used by men who make the announcements each evening in a large camp. Such a man was once brought in to make a recording with the statement that he was more than a hundred years old. The writer expected to hear a weak voice, but his voice was astounding in its volume and force.

Some men can sing in falsetto, and there are men who have their own manner of tone production that is admired. Thus songs were obtained in 1911 from a young Chippewa who came down from Canada to Red Lake, in Minnesota, to attend a celebration. He sang with a peculiar throaty *vibrato* and said that he discovered his ability to do this when a child and had cultivated it ever since. It is heard in the records of his songs.

Use of words.—This custom differs in various regions. For example, the Chippewa use few words in their songs—only enough to indicate the idea. One of their old songs is in honor of a warrior named Cimau′ganĭc and the only words were translated "Cimau′ganĭc killed in war." In such a song the name of a popular hero may replace that of an old warrior, the words of praise remaining the same. Such words generally occur in the middle of the melody, the remainder of the tones being sung with the native tone production requiring no words. In contrast, the songs of Santo Domingo Pueblo contain words through the length of the melody, often describing in detail a custom, such as that of bringing in a harvest of corn from the field.

Accuracy in repeating a melody.—In certain ceremonial songs it is required that a song be repeated if there is the slightest mistake in its rendition. The writer has recorded many repetitions of dance songs in which there was not the slightest difference. This custom however, is not universal. In a series of renditions of a song by a good singer there are often short, passing tones and by-tones. These are permissible to a good singer, as in our own race. In one tribe many differences were noticed in the renditions and the singer was asked to record the song only *once*. He did so, and a simple melody was heard instead of the rather elaborate versions that he had been recording. In reply to the writer's question, he said that he intended to sing it a little differently every time and that his ability to do so was a mark of his skill as a singer. This has not been found elsewhere.

Improvisation.—This custom has been recorded in only one tribe, but was connected with folk stories which have not been a subject of special study. It was found among the Northern Ute and several examples were recorded. In these instances the entire folk tale was sung instead of spoken. The melodies contained no rhythmic units nor repetitions of phrases yet the singing of each story had an individuality that was, in some way, characteristic of the actors in the tale. Thus a story about the prairie dogs was expressed in an *agile* melody and the song about the bear who stole the wolf's wife was sung to a slow, simple melody. The story about the wolf's little children who won a race was sung to a melody with a compass of 11 tones, moving freely within that compass. Three of these songs were recorded by an aged woman who said that she learned them from her mother, up in the canyon. When she was a little girl her mother sang them to her and told her of the time when "the wolves were people." An additional song of this sort was recorded by another woman who was known as Fanny Provo, but no others were found.

Difference in tempo of voice and drum.—In many recorded songs the tempo (metric unit) of the voice is not the same as that of the drum. A singer may sing in one tempo and beat the drum in a different tempo, or he may sing in one tempo while the drum is beaten in a different tempo, by another Indian. In a comparative analysis of 60 old and 62 comparatively modern Sioux songs, the tempo of voice and drum was different in 31 songs of the former group and in only 15 songs of the latter group. A similar comparison was not made in any other tribe.

Change of pitch-level during renditions of a song.—This peculiarity was found to the largest extent in the songs of Santo Domingo Pueblo, N. Mex., though it occurred also in songs of the Yuma in southern Arizona, the Makah in Neah Bay, Wash., and the Winnebago in Wisconsin. This peculiarity has been widely noted in primitive music and mentioned by writers on that subject. After noting the rise in pitch-level in many Santo Domingo songs, the singer was asked whether it was intentional. He replied without hesitation, "Yes, that is the way my grandfather taught me to do when he taught me the songs." He added that the rise in pitch-level was used in the old war songs. In some songs the pitch-level was gradually lowered, the change in both instances being about a semitone, after which the new pitch-level was sustained to the end of the performance.

Certain mannerisms are connected with various classes of songs. Thus the dancing songs of the Sioux Sun Dance were sung with a "jiggling" tone. This was heard also in recordings of similar songs by the Northern Ute. The Choctaw of Mississippi use different "shouts" with each class of dance songs. This may be a form of the "hollering" that is a custom of Negro singing and was designated by that name among the Seminole of Florida. Similar "shouts" have not been heard in songs of northern tribes. The syllables "*ho ho ho ho*" are heard in the Chippewa songs of the Mĭde'wiwĭn, occurring during the songs and between renditions. Similar sounds are made by medicine men when treating the sick. War songs in many tribes may be interrupted by sharp cries or explosive sentences, and similar cries may follow the songs. In some widely separated tribes the labial *m*, with the lips closed, is heard during portions of the song. It is apart from the purpose of this brief paper to document the foregoing statements which are described in various books by the present writer, but their occurrence shows a degree of technique among Indians and limited standards of excellence in their musical performances.

The intention of the writer's work has been to discover what music means to the Indian and to describe it from his standpoint. In that work it is necessary to use musical terms that are familiar to musicians of our own race, though they are not accurate. Music is a source of pleasure to Indians, and skill according to their standards is appreciated and honored, but music to them, in its highest sense, is connected with power and with communication with the mysterious forces that control all human life. In that, even more than in the sound of the singing, lies the real difference between the music of the American Indian and that of our own race.

SMITHSONIAN INSTITUTION
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Anthropological Papers, No. 37

The Belief of the Indian in a Connection between Song and the Supernatural

By FRANCES DENSMORE

THE BELIEF OF THE INDIAN IN A CONNECTION BETWEEN SONG AND THE SUPERNATURAL

By Frances Densmore

An important phase of Indian music is known as the dream song, which is common to many tribes. These songs are not composed but are said to come to the mind of the Indian when he has placed himself in a receptive attitude. To this extent the source of the song is not unlike the inspiration sometimes experienced by composers of our own race, but the use of the song is entirely different. Our composer regards the song as a possible source of applause or wealth while the Indian connects it with mysterious power. An old Indian said to the writer, "If a man is to do something beyond human power he must have more than human strength." Song is a means through which that strength is believed to come to him.

In this, as in all close study of Indians, the student is hampered by lack of an adequate vocabulary and a knowledge of the idioms of the Indian language. A careful interpreter is necessary, with many patient conferences between the interpreter and the Indian as well as with the student, but the result is worth the effort. For example, if the Indian uses a word meaning "spirit" and it is interpreted as "*a* spirit" the significance is changed and there enters the concept of a material form, so the presence of a spirit may be assumed when it is not in the mind of the Indian. On one occasion the writer was questioning Lone Man, a trusted Sioux informant and singer, concerning information received from a pipe. He was asked whether a spirit entered into the pipe and gave the information. He replied this was not the case, saying that under certain conditions a pipe might "become sacred" and speak to the Indian. Among the Sioux Indians the term "wa'kaŋ" is used in referring to any mystery. The term "Great Spirit" is commonly used as the English equivalent of the Sioux word "Wakaŋ'taŋka," which consists of two adjectives, wa'kaŋ, "mysterious" and taŋ'ka, "great." Throughout the writer's work the term "Wakaŋ'taŋka" is used.[1] In old times this word was not used in ordinary conversation, as it was held too sacred to be spoken except with reverence and at a proper time. That which remains unspoken must be considered in any study of Indian thought, together with the fact that a "sacred language" is sometimes used by which ideas can be conveyed between initiates without being understood by others.

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[1] Densmore, Frances, Teton Sioux Music, Bur. Amer. Ethnol. Bull. 61, p. 85. 1918.

To a white man the term "dream" is connected with unconsciousness, but the Indian term implies an acute awareness of something mysterious. Dreams and their songs may come to an Indian in natural sleep if his mind is conditioned to such an experience, but the first important dream comes to a young man in a fasting vigil. He is alone in some silent place, and his mind is passive, as he hopes for an impression to come to him from a mysterious source. The silence becomes vibrant, it becomes rhythmic, and a melody comes to his mind. This is his "dream song," his most individual possession. An aged man once recorded his dream song for the writer, then bowed his head and said tremulously that he thought he would not live long as he had parted with his most precious possession. The white musician composes songs addressed to his deity. The Indian waited and listened for the mysterious power pervading all nature to speak to him in song. The Indian realized that he was *part* of nature—not *akin* to it.

By means of his dream song and by performing certain acts a man might put himself again in contact with the mysterious powers seen in his dream. Others might know the song from hearing him sing it, but no results would follow if they had the temerity to sing it. Yet a man might share his song, its power and its benefits, if he so desired and if someone were willing to pay the price. A man once offered to record his song to bring rain, saying the writer could bring rain at any time by singing it and that he would still have power to do so. His price was $50, and it is needless to say that his offer was declined. The dream songs of the warriors of former days are sometimes sung in the war dances, the name of the warrior being honored in this manner, and the dream songs of forgotten warriors may remain in use, the name of the warrior being lost and only the song remaining.

The bird or animal that appeared to the Indian in his dream was an embodiment, to some extent, of the power that he desired and, by his individual temperament, was best fitted to use. A dream of a bear was especially favored by those who treated the sick, as the bear has such good claws for digging herbs which it eats. With the song, a bear may reveal certain herbs to be used by the medicine man. The warrior may dream of a roving wolf, and the hunter may dream of a buffalo. The creature seen in the dream is often mentioned in the song and may be made known in the man's name. Brave Buffalo, a Sioux who recorded several songs for me, had his first dream when 10 years old and in that dream he saw a buffalo. His Sioux name was Tataŋ′ka-ohi′tika, meaning "brave buffalo bull," but he was commonly known as Brave Buffalo. Later he dreamed of elk and wolves, and he recorded the songs received in these dreams.

Dreams concerning forms of nature may be regarded as more primitive than dreams concerning birds or animals, and songs are received from such powers. Such was the dream of a young man who lived to be an old warrior of the Pawnee. His name was Eagle. As a young man he was afraid of the storm and wept when he heard the thunder, but in a dream the thunder spoke to him slowly and said, "Do not be afraid, your father is coming." He heard the thunder sing, learned the song, and sang it when he went to war.[2] The words are freely translated:

> Beloved it is good,
> He, the thunder, is saying quietly,
> it is good.

The term "thunderbirds" is more familiar than the term that carries no implication of a material form. Two of the writer's Sioux singers had dreams in which the thunderbirds assumed the form of men riding on horses.[3]

Two Chippewa dream songs were concerning the wind. They were recorded by Ki′miwun, "Rainy," at the remote village of Waba′ciñg, on Red Lake in Minnesota. They appear to be the dream songs of forgotten men, as no origin was ascribed to them.[4] The first was used in treating the sick and the words are evidently concerning the man's dream. They are translated:

> As the wind is carrying me around the sky.

The use of the second song was not known, but it had come down from a former time and was still sung. The words are:

> One wind, I am master of it.

A member of the Makah tribe, in northwest Washington, related a dream in which the Southwest Wind appeared to him in the form of a man and sang a song, which he learned. This man was a prominent member of the tribe whose name was Young Doctor. He said the words of this song are not Indian words—they are in no known language, and he called it the "wind language." [5]

Passing from songs of the thunder and the wind, we turn to a song of the Yaqui concerning a simpler manifestation of nature. The Yaqui songs were recorded at Guadalupe village, near Phoenix, Ariz., in 1922. These Indians were citizens of Mexico and preserved many of their tribal customs including the Deer Dance. The songs of this dance are concerning the actions of various birds and animals but one is of special interest. The words were translated, "The bush is sitting under the tree and singing." The interpreter explained that the last word was correctly translated as "singing," but that it referred to the putting forth of magic power. The bush, "sitting under the tree," shared in the power that pervades the universe.[6]

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[2] Densmore, Frances, Pawnee Music, Bur. Amer. Ethnol. Bull. 93, pp. 61, 62. 1929.

[3] Densmore, Frances, Teton Sioux Music, Bur. Amer. Ethnol. Bull. 61, pp. 159, 170. 1918.

[4] Densmore, Frances, Chippewa Music—II, Bur. Amer. Ethnol. Bull. 53, pp. 263, 271. 1913.

[5] Densmore, Frances, Nootka and Quileute Music, Bur. Amer. Ethnol. Bull. 124, p. 256. 1939.

It is customary for a man to wear or carry some article connected with his dream which shows its general subject, though he may not reveal all its details. A song of the Sioux Sun Dance mentions the wearing of certain symbols as a requirement of a dream. This song was recorded by Red Bird on the Standing Rock Reservation in North Dakota, in 1912.[7] It was sung at a Sun Dance by the Intercessor, during one of the periods when the dancers rested, the people listening attentively. In explanation, Red Bird said that the Intercessor, in his dream, saw the rising sun with rays streaming out around it. He made an ornament which represented this and wore it. The ornament is a hoop with feathers fastened lightly to it. The hoop represents the sun and the feathers fastened to it are the feathers of the eagle, which is the bird of day; the crane, which is the bird of night; and the hawk, which is the bird of prey. The words were:

(*First rendition*)

The sun is my friend,
a hoop it has made me wear,
an eagle it has made me wear.

(*Second rendition*)

The moon is my friend,
a crane it has made me wear,
a hawk it has made me wear.

The use of music in the treatment of the sick has been a subject of special study by the writer in many tribes, and the songs used in such treatment have been recorded, together with the dreams in which they had their origin. The man who recorded the largest number of such healing songs was Eagle Shield, a Sioux who recorded nine songs that he used in his own practice. His specialty was the treatment of fractures, and he recorded a song that he sang four times "while getting ready to apply the medicine." Most of his remedies for adults were received from a bear, and one song contained the words "bear told me about all these things." Certain procedures were often part of his treatment and one of his songs was sung only three times when administering a certain herb. His remedies for children were received from the badger and there were no songs with these remedies.[8]

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[6] Densmore, Frances, Yuman and Yaqui Music, Bur. Amer. Ethnol. Bull. 110, p. 162. 1932.
[7] Densmore, Frances, Teton Sioux Music, Bur. Amer. Ethnol. Bull. 61, p. 139. 1918.

A study of the dream song in many tribes reveals the place that song occupied in the life of the American Indians. They had their songs with games, dances, legends, and folk stories but those phases of their music were apart from its chief function—their communication with the supernatural, through which they believed that they could secure aid in every undertaking.

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[8] Op. cit., pp. 253-267.

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Anthropological Papers, No. 38

Aboriginal Fish Poisons

By ROBERT F. HEIZER

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PREFACE

The aboriginal use of poisons is a rather neglected field of research,[1] a situation somewhat surprising in view of the abundance of data bearing on native uses of toxic substances. There has been, for example, no general study of North American arrow poisons, yet our ethnographic literature constantly refers to their use and identification.[2] The larger study of ethnobotany, of which ethnotoxicology is a component, has for long been a subject of interest, and we have many good works dealing with native utilization of plants. It is a specialists' field, however, and only rarely does an ethnobotanist have the requisite anthropological background and insight to produce a work which satisfies competent students in both fields.[3] It is for this same reason that I am somewhat reluctant, as a nonspecialist in botany and toxicology, to offer this study. But since we lack any general statements whatsoever on the subject of fish drugging, it is felt that what is offered here will be useful in view of the lack of any other general review. In dealing with piscicides the cultural rather than the purely botanical or toxicological aspects of the data have been emphasized.[4]

There is, in the present study, no attempt at presenting any theoretical thesis. It is hoped, however, that the data contained herein will show by themselves certain facets of primitive thought and psychology. Few today would deny the existence of logical thought on the part of preliterates and still claim seriously that "prelogical" thought (in the sense of Lévy-Bruhl) is the only form of thinking which determines primitives' actions and reactions. Both types of mental process do exist, and they are useful concepts serving as interpretative tools. I feel that the present data on piscicides show the essentially matter-of-fact, logical, cause-and-effect type of human thought as applied to that fundamental urge, the food quest.

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[1] Lewin (1923) has specialized, as a toxicologist, on arrow poisons.

[2] A start, but always from a regional standpoint, on this problem has been made. See, for example: Hoffman, 1891, 1896, p. 284 ff.; Beals, 1932, table 89; Spier, 1928, p. 259; Birket-Smith and de Laguna, 1938, p. 465; Heizer, 1938, 1943.

[3] Vestal and Schultes' (1939) Kiowa economic botany is one of these exceptions, as are the numerous works of Volney H. Jones of the University of Michigan. For a stimulating view on specialized aspects of the relation between man and plants, see Sauer (1947).

[4] For botanical and toxicological data on plants and plant toxins employed in fish drugging, see Greshoff, I (1893), II (1900), III (1913), 1909; Radlkofer, 1887; Ernst, 1881, 1888 a, 1888 b; Howes, 1930: Maiden, 1894; Killip and Smith, 1931; Hamlyn-Harris and Smith, 1916; Vellard, 1941; Priess, 1911; Gillin, 1936, pp. 12–13; Roark, 1936, pp. 27–38; 1938, pp. 25–37.

The procedure followed here is the simple one of presenting the collected data in tabular form, translating these items into a cartographic representation (map 2), then discussing these raw data at some length in interpretative sections as to possible origins, analysis of distributions, and probable history of the complex. The discussion progressively leaves in its wake a series of unsolved problems. Inconclusiveness need not signify insolubility; it is merely that the major problem of presenting the mass of data seems most important at this time.

This study had its origins in the subject of fish drugging in California, the data being derived from the new and extensive Culture Element Distributions Studies of the Department of Anthropology of the University of California. A summary of the Californian data is presented in the proper place, the abundance of data from other regions in the world making the former seem inadequate as a springboard from which to proceed to the larger considerations connected with fish poisoning in general.

I should like to express my indebtedness to Dr. A. L. Kroeber for his suggestion that I enlarge the earlier study to its present amplitude. to my colleagues, Dr. T. D. McCown and Dr. R. H. Lowie for several long and helpful talks on the subject. Dr. C. O. Sauer has also aided me, and I here express my appreciation for his encouragement.

I am particularly indebted to Dr. Harold St. John, of the Department of Botany, University of Hawaii, and Dr. E. P. Killip, of the Smithsonian Institution, who performed the difficult task of checking and revising the botanical names in the tables.

ABORIGINAL FISH POISONS

By Robert F. Heizer

INTRODUCTION

METHODS OF EMPLOYING PISCICIDES

The universal feature of fish stupefying is simply the recognition of a narcotizing, sometimes lethal, effect on the fish by introducing the poisonous principle of a plant into the water. An effective plant piscicide must fulfill certain conditions, among which are great solubility, rapid diffusion in the water, high potency so that it is effective in dilute solutions, and it must have such an effect that the fish itself does not have a toxic quality when eaten by humans. The techniques are somewhat varied, and are classified as follows:

(1) *Dumping crushed plant materials into the water.*—This is the most common method; universally present within the area shown on map 2 where piscicides are employed. Plant materials (roots, leaves, fruit, seeds, or whole plant) and tree saps are crushed or otherwise extracted and put into the water. The limiting condition here seems to be in the location selected; either a pool, or slow-moving stream. Sometimes this is artificially formed by a rock or brush dam (weir). At any rate, very large bodies of water (rivers, lakes, tidal lagoons) would ordinarily allow too much dilution or dispersal of the poisonous juices, as would also be the case in a small, rapidly flowing stream. Thus, the area to be poisoned must be amenable to fairly intensive and restricted action by the poison.[5]

(1a) *Sousing crushed plant materials, held in a container, in the water.*—The plant material for fish drugging may be so highly effective that only a little is needed to produce the desired results. In this event, the crushed plants may be put in a bag or openwork basket, soused up and down in the water, and then taken out. This is, of course, a modification of the simpler first method, and is an application best suited to plants of high toxicity. The presence of large amounts of plant toxin might kill all the fish over a very wide area.[6]

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[5] Chapple and Coon (1942, p. 158) suggest that "fish poisoning is most common in tropical regions, for warm water is necessary if it is to be effective."

[6] Greshoff (I: 126) notes that the juice of *Euphorbia cotinifolia* L. "is used to kill fish in running water, 1 litre being sufficient to kill all fish in a distance of 1 or 2 miles."

(2) *Poison-bait fishing.*—The actions of various plant toxins differ. Some are stomach poisons; others affect the functioning of the respiratory apparatus of the fish through haemolysis of the red blood corpuscles; still others affect the nervous system. Commonly the toxic principle in plants used as piscicides are found to be saponins (sapotoxins), alkaloids, and glucosides. Some plant toxins act as stomach poisons. In this latter case, the plant may be ground up and mixed with bait into small pellets. These, when thrown into the water and swallowed, soon bring the dead fish floating to the surface.

(3) *Fish poisoning with inorganic chemical substances.*—The use of inorganic chemicals for fish poisoning has not been treated in this paper. Its occurrence should at least be noted. Lime, produced from calcined coral, is used in the western Pacific in the following manner: A water hole or slow-moving stream is selected, lime is thrown in with the immediate effect of killing (*not* narcotizing) all the fish. This is a very wasteful procedure, and is less favored than the use of plant poisons which act as stupefacients.[7] The use of lime in fishing has also been noted for the Nicobar Islands (Whitehead, 1924, p. 99), in ancient Italy,[8] India (Khan, 1930, p. 193), the Malay Peninsula (Anon., 1898, p. 217), France (Anon., 1884, p. 186), and Palestine (Hornell, 1941, p. 127).

(4) "*Fish Smoking.*"—So far as I have been able to determine, this is a fishing method restricted to two Northern Paiute (Paviotso) groups of the Great Basin area of western Nevada. A fire was built near the water's edge and the smoke fanned out over the water; the result being that the fish (brook trout) floated to the surface. It is not clear how this method works, since the plant which was burned is not mentioned.[9]

BOTANICAL LISTS IN THE SOURCES

Ernst, 1881. Fish-poison plants listed under 17 families; pp. 144–146.

Fagundes, 1935. Alphabetical list (by genera) of fish-poison and insecticidal plants; pp. 70–74.

Greshoff I. Alphabetical index of plant families; pp. 176–179. Alphabetical index of genera and species; pp. 180–201. (Italicized names are fish-poison plants).

Greshoff II. Alphabetical index of plant families; pp. 199–204 (includes the plants treated in this work and in Greshoff I (1893), pp. 176–179). Alphabetical index of genera and species; pp. 205–243.

Greshoff III. Alphabetical list of genera and species with the family to which each belongs; pp. 165–179. Alphabetical list of families, genera, species, and folk names of all plants treated in Greshoff I, II, III; pp. 181–370.

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[7] Hamlyn-Harris and Smith, 1916, p. 2 (Solomon Islands).

[8] Pliny the Elder (Natural History, Book 25, ch. 54) cited by Hamlyn-Harris and Smith, 1916, p. 2; Butler, 1930, pp. 150–151.

[9] Stewart, 1941, element 293a, note p. 426.

Hamlyn-Harris and Smith, 1916. Fish-poison plants arranged under 16 orders; pp. 7–22. Classification of fish-poison plants into four groups according to efficiency, p. 7.

Howes, 1930. Index to fish-poison plants arranged alphabetically by genera; pp. 151–153.

Radlkofer, 1887. List of fish-poison plants subsumed under 35 orders; pp. 401–415.

Raizada and Varma, 1937. List of 53 Indian fish-poison plants under 30 families; pp. 204–215.

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SOURCE LISTS OF GENERA CONTAINING CERTAIN PLANT TOXINS

Cyanophoric: Greshoff II, pp. 21, 71; Greshoff, 1906; Pammel, 1911, pp. 89–90, 53.

Sapotoxin: Greshoff I, pp. 27, 33; Greshoff II, pp. 8, 34; Greshoff III, passim; Hamlyn-Harris and Smith, 1916, p. 7; Pammel, 1911, p. 89; Vellard, 1941, pp. 86–94.

Cumarine: Greshoff II, pp. 11, 92; Greshoff III, pp. 9–10.

Cytisine: Greshoff II, p. 44.

Andrometoxine: Greshoff II, p. 96.

Berberine: Greshoff II, p. 17.

Rotenone: Filho, 1935, pp. 20–21.

For further data, see the special literature: e. g., Allen (1929), Henry (1924).

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FOLK NAMES OF FISH-POISON PLANTS FOUND IN THE SOURCES

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Howes, 1930, pp. 151–153.

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Killip and Smith, 1935, pp. 20–27.

Radlkofer, 1887, pp. 379–401, passim, 415–416.

Vellard, 1941, pp. 81, 82–84.

Roark, 1936, pp. 2–12.

Roark, 1938, pp. 3–10.

THE ORIGINS OF FISH POISONING

The origins of fish drugging are a matter of some theoretical interest. Like most beginnings, however, we are without proof as to place, time, or manner. All we can at present hope to do is to furnish data from which one might infer the manner of origins.

Notwithstanding the fact that the first use of plants as piscicides may have been accidental, their purposive use depends basically upon one principle, namely, the empirical recognition of their toxic properties. To conceive of primitives as slavishly following the custom of pounding certain plant roots, throwing them in the water, and seeing stupefied fish come to the surface, without their having some idea that the plant contained poisonous properties and that the drugged fish resulted from their action, is impossible. In short, the custom among primitive peoples of fish drugging rests on an empirical basis; a definite cause-and-effect relation based on observation is implied.

Greshoff (I, II, III, passim; 1909) gives citations which indicate that primitive peoples the world over recognize and use plants for such purposes as anthelmintics, emetics, narcotics, intoxicants, soaps, insecticides, abortives, antidotes, purgatives, medicines, arrow poisons, vermicides, counterirritants, sedatives, bait poisons, febrifuges, aphrodisiacs, and stimulants. It is well known among certain primitives that animals find certain herbs poisonous. Pastoralists find, particularly among the Leguminosae, plants which poison their stock. It would seem that some empirical observation of poisons would be almost impossible for any native group to avoid. This would be most common on the hunting-fishing rather than a "civilization" level of culture, and generally it is in the former groups that the best practical application of this knowledge for food getting is made.

It is probable that fish stupefying was not invented by coastal people dealing with large bodies of water who gather fish there by mechanical means (i. e., hooks, nets, weirs, or harpoons), but probably by interior peoples who had access to small, quiet streams and to whom fish was probably a subsidiary item of the dietary. No primitive people seem anywhere to follow fish poisoning as a primary economic pursuit—to do so consistently and over a long period of time would exhaust the stream population.[10] It would appear, therefore, to be an addition to a hunting-gathering type of existence. Its position in such a society would, therefore, seem to be that of an auxiliary food-getting technique. Where fish poisoning is a coastal trait, it seems to have come out of the interior.[11] Where it is found on the coast, it is a technique specifically applied to tidal pools (e. g., Oceania); as often as not there (as also on the California coast) it is a means of catching sea life other than fish, such as octopus, shrimp, and crayfish.

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[10] This applies more to settled groups, permanently resident on some stream. Wandering, nomadic groups with a seasonal round through a circumscribed, but extensive territory, might not visit a stream in which fish stupefying had been practiced for several months, thus allowing the stream to maintain its population. Cornevin (1887, pp. 425–426, cited by Greshoff I, p. 97) discusses the effect of poisons in killing fish and smaller life forms in water courses.

Theoretically, the most simple origin of fish drugging would result from the observation of fish eating, or being otherwise affected by, poisonous fruits which fell into a pool from overhanging branches.[12] This is Aristotelian in its logic, simplicity, and, one might add, improbability.

Fish weirs made of branches of poisonous trees or brush might naturally dissolve out toxic substances acting as a stupefacient. This, too, seems only a logical possibility.

Greshoff (I, p. 102) reproduces an interesting statement to the effect that, "The bark [of *Echaltium piscidium* Wight in India] contains a great deal of fibrous matter, used by the natives as a substitute for hemp. In steeping some of the young shoots in a fish pond, in order to hasten the removal of the bark and cleaning the fibers, many, if not all, the fishes were killed." In some such accidental manner as this, natives might be led to recognize the piscicidal qualities of certain plants. A similar example is given by Marsh, Clawson, and Marsh.[13]

The poorer people among the Greeks and Romans and the Cynic philosophers made use of lupine meal in bread. The bitter principle (lupanine, a plant alkaloid) was recognized not only as disagreeable but as injurious, and the seed was especially prepared to get rid of this property. Among the Greeks the seeds were cooked till soft, to remove the outer skin, then placed in sacks in shallow places on the seashore to wash out the bitter principle. Afterward the seeds were dried, ground in a hand mill, and baked into a poor bread.[14]

The use of saponaceous plants for soaps is widely known [15] among primitive peoples. Very commonly, too, sapotoxic plants are used as fish poisons.[16] Thus, using saponaceous plants in water might have the incidental effect of narcotizing fish in the vicinity and thus lead to recognition of their toxic property. However, we do not know whether the use of saponaceous plants for soap preceded the use of sapotoxins as piscicides. I give here only one sample from a number of possible ones. The fruit of *Randia dumetorum* Lam. is used instead of soap by the hill people in many parts of the Himalayas; it is also used as piscicide.[17] This again brings up the question of the natives' recognition of poisons.

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[11] Note, for example, California, where the great bulk of fish poisoning is interior; in its northward spread it apparently went through the interior instead of along the Oregon coast.

[12] See Swanton, 1931, p. 55. In Mississippi, the "Winter berries" (*Ilex verticillata*) which fall into a stream naturally drive the fish away. E. B. Tylor (1925, p. 213) postulates fish poisoning as originating from branches of toxic plants of trees or poison fruits falling into the water.

[13] 1916, p. 2 (after Landerer). (See also Cornevin, 1887, p. 314, for the same data.)

[14] Water soaking to remove bitter substances is extremely widespread as I have shown in a separate paper on leaching. Mention may be made here of the Californian example of leaching buckeye nuts (*Aesculus*) to remove the cyanophoric content, and also of the fact that buckeye nuts are used as a fish posion. (See Barrett and Gifford, 1933, pp. 148–149, Miwok; Beals, 1933, p. 351, Nisenan; Driver, 1936, p. 187, Wappo; Loeb, 1926, p. 173, Pomo.)

[15] Bibliography of saponin plants in Greshoff III, 1913, p. 9. (See also Rose, 1899, pp. 231–237.)

[16] See Greshoff II, footnote (1), pp. 8–9, for a list of plant families and enclosed genera which are saponin bearing.

Here are a few examples of primitives who recognize plant poisons objectively. The natives of Madagascar say that birds die soon after eating the fruit of *Diospyros toxicaria* Hiern (Greshoff II, p. 103). The Ainu use a decoction of *Picrasma ailanthoides* Planch. bark to kill lice. Should deer eat the bark they soon die—hence the Ainu name of "deer-killing tree" (Batchelor, J., cited by Greshoff II, p. 30). In India the fruit of the *Hydnocarpus wightiana* Bl. occasions giddiness if eaten, and the fruit is greedily devoured by fishes, but fish taken by these means are not fit to be eaten, occasioning in humans vomiting and other violent symptoms.[18] The clearest demonstration of objective recognition of poisonous principles in plants and their effects, both potential and applied, lies in the numerous instances of plants which have several distinct uses, each of which is assignable to the action of the contained toxin. Thus, certain plants commonly serve a multiple purpose as piscicide, arrow poison, narcotic, and vermicide.[19]

THE CULTURAL STATUS OF PISCICIDES

The differential use of certain plants in salt or fresh water seems to have an empirical basis, since the distinction is widely distributed in the Old and New Worlds.[20] The inference here is clearly that certain plant toxins were more effective in fresh water than in salt water and vice versa. Conceptually related would be the observed effect or noneffect of the same poison on certain fish species. For example, the *yarau* fish is said by the Makusi not to be affected by the poisonous juice of *Lonchocarpus*, but succumbs to the action of *Tephrosia toxicaria* (Roth, Walter E., 1924, p. 204). As a further extension of the concept of objective differentiation in the eyes of the native there could be mentioned the selective use of certain parts of plants. The toxic qualities of certain plant roots, fruits, and leaves differ quantitatively—i. e., the poison content is variable. *Diospyros* fruit, *Sebastiana* sap, *Verbascum* seeds, *Aesculus* nuts, and *Phyllanthus* leaves seem to have been consistently and independently selected in widely separated areas—in each case we note that the toxin content is ordinarily higher in the part singled out for use.[21]

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[17] See Greshoff II, p. 34, footnote (1), for a list of saponin-bearing fruits. Greshoff I, p. 42, describes the dual use (piscicide and soap) of *Sapindus saponaria* L.

[18] Greshoff II, p. 21: Greshoff I, pp. 19–20 (Ceylon); Greshoff III, p. 85; Goupil, 1812.

[19] Greshoff I, II, III, passim; Howes, 1930, passim; Hamlyn-Harris and Smith, 1916, pp. 1–6.

[20] Cf. Hamlyn-Harris and Smith, 1916, p. 4 (Australia); Taylor, 1938, p. 145 (Dominica, W. Indies); Hornell, 1941, pp. 126–127 (Palestine).

[21] See the tables in this paper. See also Radlkofer, 1887, passim. Pammel (1911, pp. 82–83) has a discussion of the varying toxicity of different *parts* of plants.

On the other hand, we must recognize that difficulty sometimes arises in distinguishing between real and imaginary (i. e., magical) poisons. In Australia, where witchcraft is linked with the concept of poisoning, this is often the case (Hamlyn-Harris and Smith, 1916, p. 3; Greshoff III, p. 89). A parallel is offered by the Pomo of west central California who conceive of *Angelica* root as a powerful magical substance and extend its conceptual effectiveness to employment as a piscicide.[22] *Angelica* seems never to have been used alone as a piscicide, but was always mixed with some other plant. Therefore, *Angelica* roots might have made the actual poison more effective in the native's eyes. It is possible that an Indian who cast *Angelica* roots alone into the water and observed no results might blame the failure of the poison to act either upon counter-magic which worked against the *Angelica*, or he might have said to himself, "No fish, therefore not a poison." We need further information to judge whether the native would rationalize or justify the noneffectiveness of the *Angelica*, or whether he would give a practical explanation in terms of empirically observed physiological noneffect or effect. It is of interest to note that these innocuous "poisons" are often mixed with actual, proven toxins when employed as piscicides—this would enable the primitive to justify his belief in their effectiveness.

The rational basis of the use of piscicides is again brought out by the fact that we have "composite" fish stupefacients. Although it is clear that magical and actual poisons are sometimes confused,[23] there are numerous instances on record of compounding two or more plants with definite piscicidal properties. These mixtures came about probably as an elaboration in technique; thus, if a group originally knew only a single plant, then tested and used other plants by extension of the idea,[24] they might ultimately wish to combine several stupefacients into a single mixture. This is apparently what has occurred in several places independently.[25]

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[22] Gifford and Kroeber, 1937, p. 320. A similar situation comes to mind with reference to south Alaskan whaling, where magical poisons seem always to have been applied along with a herb poison (root extract of *Aconitum*) to the detachable slate lance head. (See Heizer, 1938, p. 359.)

[23] In addition, all sorts of social customs may impinge on the action of fish poisons. For example, among the Malaya Negritos pregnant females may not accompany a fishing party nor may the fishers mention Malays, blood, jungle leeches, or the private parts of a man or woman, lest poor results attend the venture (Evans, 1937, p. 219). The Guatemalan Chorti use fish poisons only when the moon is in quarter-stage "when the plants are supposed to be most toxic" (Wisdom, 1940, pp. 77–78).

[24] *Asclepias curassivica* L., a native of the West Indies, made its appearance in Queensland about 50 years ago. It was tested and found suitable as a piscicide by the Don River natives. It has been further used as a love charm by the men of the Penney Feather district (Hamlyn-Harris and Smith, 1916, p. 18). This is a provable case of natives testing, observing, and applying a new plant as a piscicide. In Fiji, according to Hornell (1941, pp. 127–128), *Derris malaccensis* Prain was introduced from New Guinea, but is used by the natives as a piscicide.

[25] See, e. g., W. Africa (Tessmann, 1913, pp. 111–112); Siauw (Greshoff II, pp. 180–181); California (Chestnutt, 1902).

That stupefying fish by the use of plant toxins is not an exaggeratedly simple procedure is brought out by the fact that usable plant species are almost invariably more widely distributed than their recorded use as piscicides.[26] Perhaps local custom and the knowledge of several adequate plants in a group's habitat has a sufficient cultural force to offer resistance, or at any rate, lack of interest, in learning of additional plants with piscicidal properties from neighboring groups. This would be a hindering factor to diffusion once the process was known and culturally established in a given habitat. This is only one possible explanation of why people do not use one particular plant which is favored elsewhere.

Certain plants vary in their toxin content according to the time of year. In parts of California, for example, seasonal habitat shifts were reflected in moving to the mountains in summer and to the valley plains in the winter—a high toxin content in summer lowland plants might result in their piscicidal qualities not being recognized [27] or exploited.

Fish narcotizing is, however, a simple enough technique, dependent upon the observation of toxic principles in plants and their physiological effects, so that the possibility of an independent or convergent development seems not unlikely. The origins of the whole technique are obscure, but we can point to certain other parallels in *parts* of the piscicidal complex, aside from the fundamental one of the recognition of toxic properties in plants, which suggest that the mind of primitive man sometimes hits upon the same idea in widely separated areas. In Malaysia [28] and northern South America [29] the plants are put in a canoe, water is added, the plant materials are crushed and the resulting infusion dumped out by overturning the canoe. In both areas this is a community undertaking in the nature of a holiday. Another parallel is that of poison-bait fishing wherein the piscicide often acts as a true stomach poison rather than having a narcotic effect on the respiratory apparatus. The Malayan fish poison, "aker tuba" roots, is ground or pounded into a fine powder and mixed with a stiff clay and crushed refuse, such as shrimps or small fish. This mixture is made into balls, dried, and thrown into the sea like ground bait (Greshoff II, pp. 60-61; III, p. 82). In Guiana (Pomeroon and Moruca River Caribs) *Clibadium asperum* leaves are pounded, mixed with finely cut meat, and made into small balls which are thrown into the water like bait (Roth, Walter E., 1924, pp. 203–204). This technique is also used in Samoa (Buck, 1930, pp. 443–444; Hamlyn-Harris and Smith, 1916, pp. 4–5). A somewhat specialized variant is recorded for the Caribs of Dominica:

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[26] I have investigated the botanical distribution of California fish-drugging plants and find that these plants, in every case, have a much wider natural distribution than that of their cultural (i. e., piscicidal) use (Heizer, 1941, p. 44). Vellard (1941, p. 84) makes the same point for South America. Merrill (1923) found the same to be true in a study of California plant materials used in basketry.

[27] A similar situation referable to the availability of particular plants is mentioned by Hamlyn-Harris and Smith (1916, p. 3) for Australia. (See also Greshoff I, p. 90; Pammel, 1911, pp. 83–85.)

[28] Sumatra (Greshoff II, pp. 49–51); an excellent eyewitness account.

[29] Killip and Smith (1931) present a vivid circumstantial account with numerous photographs. (See also Roth, Walter E., 1924, p. 203.)

> . . . a length of caapi (species of ivy) is passed through a bit of raw manioc which is then hung in the water, the other end of the caapi being attached to a rock or stone on the bank. Returning some hours later, usually after dark, the fisherman finds a quantity of stupefied crayfish collected around the manioc, whose poisonous juice has rendered them incapable of flight [Taylor, 1938, p. 145].

Most fish poisons act fairly rapidly, their full effect being arrived at ordinarily within a half hour. Noticeable, then, is the employment of certain plant materials whose action is very slow. I refer here to the use of tannins, whose effectiveness depends on abundance rather than on a small quantity of powerful, quick-acting toxin. The use of plants with a high tannic-acid content has been hit upon both by certain natives of Australia and by the Cocopa of the Lower Colorado River. Tannin has astringent properties which have the physiological effect of interfering with the function of the gills.

Roth describes the Australian procedure as follows:

> In the Cloncurry, Woonamurra, and Leichhardt-Selwyn Districts, especially with large water holes, numerous leafy boughs and branches of "gum-tree" (*Eucalyptus microthera* F. Muell.) (Mitakoodi, joo-a-ro) are utilized for a similar purpose. The whole camp of blacks working at it, will start throwing these in the first thing in the morning; during the day the water becomes darker and darker and strongly smelling until by the following morning at sunrise when it is almost black, the fish all lie panting at the surface and are easily caught. [Roth, Walter E., 1897, pp. 95–96. See also, Hamlyn-Harris and Smith, 1916, pp. 6–7, 15.]

Gifford says of the Cocopa:[30] "No true fish poison, but small pond covered with willow (*Salix*) leaves, which discolored water, causing fish to rise in 2 or 3 days."

Just how such plants with slow-acting tanniferous properties came to be applied as piscicides is hard to say. Perhaps the origin lies in observation through accident. It is a relatively uncommon method, however, and mainly of interest here in illustrating a parallel in method in widely separated areas.

The application of plant poisons to water holes for catching game is, of course, widely known among primitive peoples. In a well-watered country there is little chance of catching animals by poisoning water holes. In an arid region where streams are scarce and water holes are important as a source of water for game, such a procedure is an effective one. Thus, it is a commonly known practice in Southwest Africa, among North African Arabs, in Australia, Arabia, and the Intermontane Plateau of the western United States southward through northern Mexico. I give two typical citations of this practice from widely separated areas: Beals (1932, p. 103) says the Opata poisoned deer by putting yerba de flecha (*Sebastiana palmeri* Riley) in the water holes. Spencer (1896, p. 52) says the Australians put the leaves and twigs of *Duboisia hopwoodii*[31] in the water hole; emu drink the impregnated water, become dizzy, and are easily killed. This hunting method may or may not be a specialized variant of the use of piscicides, since it is in vogue in some places where fish poisoning is absent.

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[30] Gifford, 1933, p. 268. See also Gillin 1936, p. 13 (Wa'u poison of British Guiana). Spier (1933, p. 291) notes a rather puzzling case which may refer to piscicides.

Howes has emphasized an extremely interesting feature connected with fish drugging—that of aboriginal cultivation of the plants used. This agricultural aspect of piscicides elevates fish drugging from the hunting-fishing stage to the sedentary agricultural level. It is perhaps a technique which has the status of a survival when present among the latter groups.[32] It is possible, since the practice of fish stupefying is essentially a food-getting technique, that farming populations might partly supplant the fish item of the dietary by grains, which would lead to the relinquishment of wholesale fishing. This might obscure (to choose a theoretical unproven example, in Mesopotamia or lower Egypt) the former use of piscicides through dependence on a cultivated-cereal–domesticated-animal-meat diet. Of course, in tropical South America (e. g., in the Guianas), hunting and fishing are important dietary adjuncts to cultivated maize, cassava, etc. There is little doubt that fish drugging is an old cultural feature in South America, and it is logical to suppose that after these tribes learned to cultivate plants (manioc, maize)[33] they extended the technique of planting maize or cassava to certain plants which were used as fish poisons.[34]

Historical data on the introduction of plants offer an interesting sidelight on our problem of placing fish drugging in its proper perspective within the total cultural picture. *Euphorbia tirucalli* L. has been introduced from its homeland in East Africa to West India and the Moluccas, and has been recognized by the natives as amenable to use as a piscicide (Radlkofer, 1887, p. 413). *Nicotiana tabacum* L. has been selected, among other cultivated plants in eastern India, as a fish stupefacient.[35] This is of interest, for various *Nicotiana* species have been used as piscicides in other parts of the world (Greshoff I, p. 108; II, p. 119; III, pp. 140, 141). It is difficult to see any connection between tobacco smoking or chewing and fish drugging aside from the fact that through smoking or masticating one might recognize in *Nicotiana* certain physiological effects which conceivably could lead to testing the plant for its piscicidal potentialities (cf. Miner, 1939). In all probability, the *Nicotiana* plants were tested along with many others in view of their employment as a piscicide and found useful. Actually, the sedentary hunters and fishers might be expected not to practice fish drugging extensively since the streams in their restricted habitat could thus be easily entirely fished out by consistent application of piscicides. It is a technique better suited to wandering groups of hunters and gatherers, since they would roam over a wider area, in whose streams natural propagation of the fish population would be easily maintained (Greshoff I, II, III, passim; 1909). Although there is much specific data on conservation of fish and game on the primitive level, I know of no primitive people who specifically refuse to practice fish drugging for this reason.[36] It is true, however, that a widely spread primitive recognition of wastefulness that ensues from this method of fishing results in techniques of control.[37]

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[31] This is the famous *pituri*, the Australian narcotic. Again we see two uses, widely different in the conception of the natives, of the same plant. The *meaning* (i. e., the psychological associations which the plant has to the native user) in terms of attitudes is different in the eyes of the primitive. (See Basedow, 1929, p. 139.)

[32] The question of survival in other areas immediately comes up. In the British Isles fish drugging is a poacher's technique among the "lower classes"—the gentleman's method of fishing is by hook-and-line. If fish stupefying were an old trait, it is among the former we should expect to find it. It is really a means of securing food in quantity—it is not a sport as such, although most primitive peoples seem to have fun doing it.

[33] For a list of cultivated food plants in South America, see Safford (1917, 1927). Nordenskiöld (1920, pp. 168 ff.) indicates that in large parts of South America the cultivation of maize and sweetpotato are fairly recent cultural acquisitions.

[34] The listing and distribution of cultivated plants used for piscicides is too extensive to cite in full. For typical cases, see Howes, 1930, pp. 135, 137 (British Guiana); *Hura crepitans* L. in Mexico (Rose, 1899, p. 257); *Piper methysticum* Forst. in Hawaii (Beckley, 1883, p. 11); Africa (Howes, 1930, p. 133); Killip and Smith, 1931, pp. 403 ff. (tropical South America).

As different groups throughout the world have experimented with fish poisons, they must have learned that many, while effectively stupefying the fish, at the same time so contaminated the fish that they were not edible (e. g., Greshoff I, pp. 10, 19–20; Bacon, 1906, p. 1026). Such plants would be used only once—ever after to be remembered as a plant to be avoided. Thus most of the recorded fish poisons are not stomach poisons, though they are probably poisonous when injected intravenously.[38] A very clear and quite typical statement as illustration follows:

> These saponins (of *Ganophyllum obliquum* Merr.) are particularly advantageous for use as fish poisons, because, whereas many are very poisonous when injected (intravenously), they are usually only slightly so when taken into the stomach

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[35] Ernst, 1881, cited by Radlkofer, 1887, p. 411. Greshoff I, p. 108.

[36] See Howes, 1930, pp. 143, 147–148; Greshoff III, pp. 39, for information on European legislation against the practice of drugging fish. Butler (1930, p. 133) notes a canon of the law from Plato that it "is not forbidden to fish in harbors or in sacred rivers, marshlands, and lakes, provided that he shall not cloud the water with drugs."

[37] E. g., Taylor, 1938, p. 145: "The babarra apples are also crushed, but are enclosed in a basket which is immersed only for the time being, as it would poison the water for almost a week were it left here." The use of excessively potent stupefacients with semipermanent effects might explain the parallel "sousing" technique of applying piscicides in Australia (Roth, quoted by Howes, 1930, p. 145).

[38] I have not thought it necessary to give citations on this aspect of fish drugging—they occur randomly through Greshoff I, II, III, and Howes, 1930.

so that even if the fish is somewhat contaminated with these substances, no harm will come from eating it. [Greshoff III, p. 83.]

While on the subject ot the nature of the effect of piscicides, it is of interest to note that Chestnut recorded from California a native explanation of mechanical, rather than toxicological effects:

> The exact cause of the stupefying or crazing effect [of *Eremocarpus setigerus* (Hook) Benth.] is not known. Some Indians attribute it to the stellate hairs which, they say, attach themselves to the eyes and gills and make them frantic. If these should become thus attached, they would undoubtedly cause great distress, but the chemical qualities of the plant may easily account for the effect. [Chestnut, 1902, p. 366.]

This case throws possible light on native thought, and may be interpreted in this way; Numerous stellate hairs are noticeable on dove weed, for the plant is covered with them like a thick, gray fuzz. But the recorded physiological effects do not necessitate the conclusion that the fish became frantically annoyed—rather, a phytotoxin is indicated. Greshoff (III, p. 231) lists 15 species of *Croton*, a genus related to *Eremocarpus*, used as piscicides, and it is known that *Croton* genus produces a toxalbumin (crotin) which does act as a powerful fish stupefacient. Thus, I am inclined to consider the Indian explanation, in this case, as a rationalization suggested by the presence of the stellate hairs. A similar explanation might arise in the case of stinging nettles, though I have not found any reference to it.[39]

In most cases the toxic plant juices merely have to be freed from the leaves by crushing and soaking. It is, therefore, of interest to note a variation of this simple method which consists of gently roasting the bark or roots in order to partially free the poison principle. Howes [40] states that in Nigeria and the Cameroons the natives half-roast thick pieces of the stem of the climber, *Ophiocaulon cissampeloides* Hook. f., pound them and cast them into the water. The toxic principle is identified as free hydrocyanic acid. In Queensland (Hamlyn-Harris and Smith, 1916, pp. 3, 9) the bark of *Jagera pseudorhus* Radlk. (*Cupania pseudorhus* A. Rich.) is cooked in the native ovens for about half an hour and put in the pond. This genus is listed by Greshoff as cyanophoric. The third parallel, but of a somewhat different nature, is that of the knowledge among the natives of the Amazon region in South America, of driving off the hydrocyanic acid contained in *Manihot esculenta* Crantz (*M. utilissima*) by the application of heat.[41] What is important here is to indicate the parallel in three areas to the effect that heat will free hydrocyanic acid contained in certain plants.[42] Apparently the gentle application of heat serves to disturb and bring out the acid; prolonged heat will free the roots or bark entirely of the poisonous principle.

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[39] It is of interest to note here that the Chorti Indians of Guatemala say that the plant saps (see table 9) "burn the eyes of the fish causing them to thrust their heads above water to escape the pain" (Wisdom, 1940, pp. 77–78).

[40] 1930, p. 133. See also Hamlyn-Harris and Smith, 1916, p. 20.

[41] A parallel is offered by the Iroquois who roast *Arum triphyllum* roots to free them of their cyanophoric content. (See Parker, 1910, p. 107.)

SIGNIFICANCE OF AREAL DISTRIBUTIONS

AUSTRALIA

Hamlyn-Harris and Smith [43] have outlined the Australian ocurrences of fish poisoning as generally distributed with the exception of the arid regions of central and south Australia. The most intensive use definitely centers in northeastern Australia (specifically Queensland). These authors have performed experimental tests with fish-poison plants [44] and have arrived at the following classification of plants according to their efficiency:

Group A.—Effective and rapid in action at great dilution: *Derris*, *Tephrosia*, *Pongamia*, "*Nero*," containing active principles associated with ether-soluble resins; the sapotoxin-containing *Careya*, *Cupania*, *Faradaya*, *Garcinia*.

Group B.—Poisons of intermediate effect: *Barringtonia speciosa*, *Stephania hernandiaefolia*—alkaloid-containing.

Group C.—Poisons of lesser effect, slow in action at higher concentrations or uncertain in action: *Acacia*, *Albizzia*, *Eucalyptus*, *Thespesia*, *Terminalia*, *Polygonum*.

Group D.—Reputed poisons, found innocuous: *Sarcocephalus*, *Pleiogynium*, *Petalostigma*, *Alocasia*, *Asclepias* (?).

As to whether the use of piscicides in Australia is due to independent development or to diffusion from outside is a difficult question to decide. Hamlyn-Harris and Smith say:

> The possibility of the introduction of the custom from such quarter (Malaysia or Melanesia) must be judged on general grounds and by the standard of recognized external influence upon aboriginal customs.
>
> Considering the universality of fish-poisoning it is not unjustifiable to assume an independent origin among the Australian aborigines, and the evolution of an empirical knowledge of efficient piscicides. [Hamlyn-Harris and Smith, 1916, pp. 2–3.] [45]

Two facts must be noted which have a bearing upon this conclusion. The first is the continuous Australian distribution of fish drugging; the second is the decided emphasis on fish stupefying in the region adjoining Melanesia, the same area in which, in other aspects of culture, the most pronounced external cultural influence has been received, viz, Queensland. I offer here an alternative theory to that

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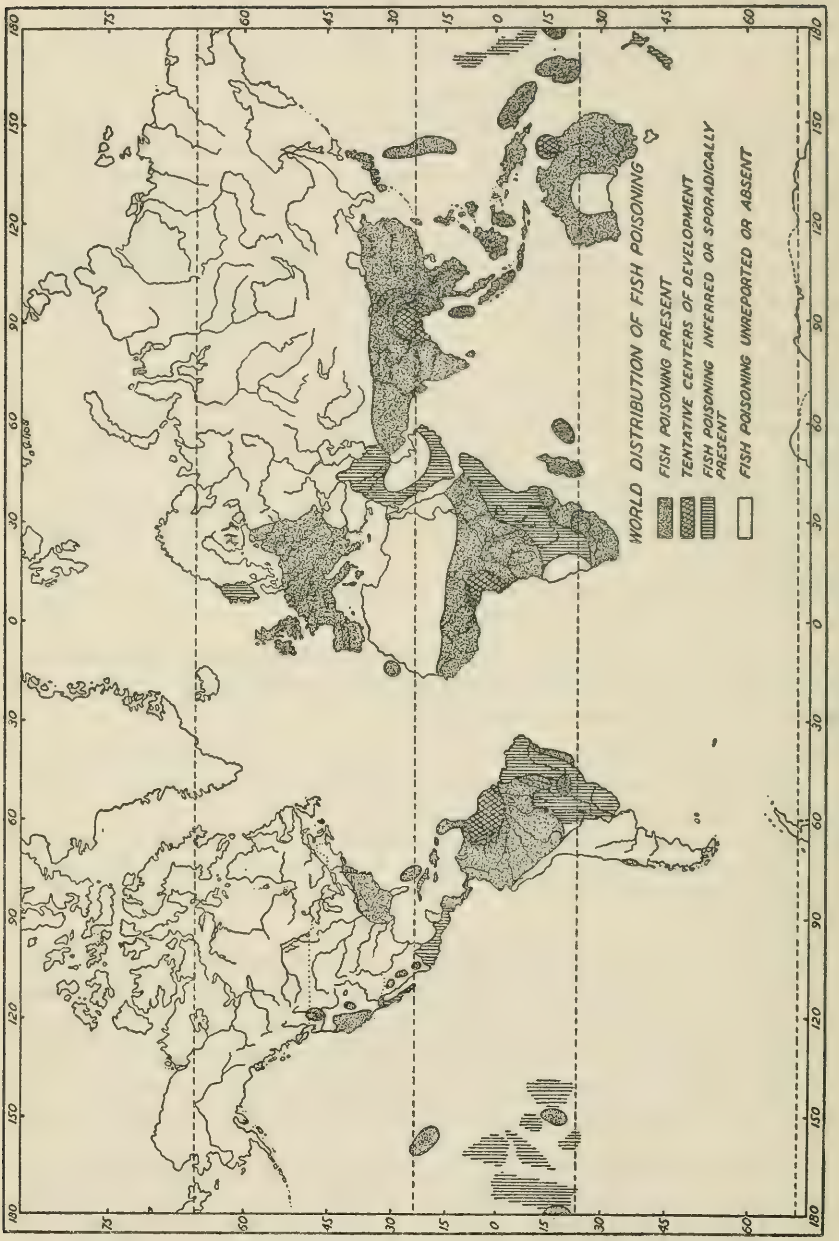
[42] There is a discussion along the lines suggested here in my separate study of leaching plant foods.

[43] 1916, pp. 1–22 (a general discussion of Australian fish drugging). This paper, with that of Maiden's (1894) covers the subject quite adequately. Both contain bibliographic data on local groups. Howes (1930, pp. 142–146) has a general discussion of Australian piscicides which includes some new data.

[44] All but the most general statements in reference to the pharmacological effects of piscicides are avoided here, since there are published data on this aspect (Greshoff I, II, III; Howes, 1930; Hamlyn-Harris and Smith, 1916; Hanriot, 1907; Greshoff, 1898; van Hasselt, 1910).

[45] Howes, 1930, p. 142, occurs in this conclusion.


WORLD DISTRIBUTION OF FISH POISONING
FISH POISONING PRESENT
TENTATIVE CENTERS OF DEVELOPMENT
FISH POISONING INFERRED OR SPORADICALLY PRESENT
FISH POISONING UNREPORTED OR ABSENT
180
150
120
90
60
30
0
30
60
90
120
150
180
75
60
45
30
15
0
15
30
45
60

MAP 2.—World distribution of fish poisoning.

proposed by Hamlyn-Harris and Smith. The concept of fish drugging may have entered Australia ultimately from Southeast Asia via Malaysia and western Melanesia. It was first received by the Queensland natives on Cape York Peninsula, where the center of development is noted. From there fish poisoning diffused through Australia wherever it was environmentally acceptable.[46] It did not reach Tasmania. In the present discussion we have repeatedly seen that the Australians exercised ingenuity in regard to the application of fish stupefacients. This leads to the conclusion that the Australian evolution, i. e., the further development of piscicides aside from the original introduction, was autochthonous and had little or no relation to historical developments outside Australia. This is the only logical inference, since it is impossible to conceive of the Australians accepting from outside sources their every technique of preparation and application of the many plants used as piscicides.

SOUTHERN ASIA AND MALAYSIA

It is difficult to draw hard-and-fast geographical boundaries and discuss the use of piscicides within such areas for the reason that such distinctions are arbitrary and do not delimit areas in which fish poisons are used—they are geographical labels which give us a starting point for discussion.

A great block of near-universal application of piscicides appears on map 2. This runs from Persia in the west to North China on the east and southward from this line to include India, Burma, and the Malay Peninsula. Eastern India and Burma seem to be the climax area of this defined distribution. The obvious extensions are into the Indian Ocean to include Ceylon, the Andaman and Nicobar Islands, the great Malaysian islands (Sumatra, Borneo, Java, Celebes), and the islands to the north (the Philippines, Formosa, and Japan). This whole great area is, in a great many ways, composed of a series of historically related units—separate histories have occurred, but in no single case have they been entirely independent of that of their neighbors. Thus, when we find a commonly distributed element of culture, we immediately suspect historical causes (i. e., diffusion) as an explanation.

OCEANIA

This area, in a geographical sense, includes the three great cultural areas of the Pacific island world—Polynesia, Micronesia, and Melanesia.

It appears from the sources consulted that piscicides are generally distributed throughout this whole great island area.[47] They occur in Hawaii, the Caroline and Marianas Islands, the Solomon Islands, and New Guinea,[48] to name typical places of each culture area (see table 2 for fuller occurrences). Fresh-water streams or tidal pools would be the best-suited places for fish drugging. Where piscicides are not used in the area the possible explanations of absence may be several. Piscicides may once have been known and subsequently given up in favor of netting, spearing, or hook-and-line techniques. Or the environment itself may be at fault in offering no convenient places to narcotize fish. Although the use of kava in Hawaii as a bait poison for sharks is included under our broad classification of fish drugging, it actually is not a stupefying technique as such, but is perhaps related in concept to the whole use of bait poisons.

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[46] This hypothesis is compatible with other historical deductions formed on the basis of geographical distribution. (See Davidson, 1936, and Warner, 1932, for studies of this type.)

Oceania, as defined here, is an area with a relatively continuous distribution of the use of piscicides. Knowing as we do the great importance diffusion has played in the formation of these various insular cultures, there is strongly suggested the possibility that Oceanian occurrences of piscicides are due to diffusion [49] and that Oceanian fish drugging is a historical entity, its ultimate origin being Asiatic.

AFRICA

Piscicides are in general use throughout Africa with the exception of the Sahara and Kalahari Desert regions. The blank area of British and Italian Somaliland may be misleading, since there is no information at all on the possible presence or absence of the complex in that area. At best, however, these territories are arid and hardly constitute a locale where one would expect to find piscicides in common use.

The area of greatest elaboration (i. e., techniques of application and diversity of plants used) seems definitely to be in West Africa in the Cameroons–French Equatorial Africa–Belgian Congo region.

Plants used for fish drugging are often cultivated in Africa. This leads to the inference that we are dealing with a very old trait in certain agricultural groups.[50] The parallel with South America is treated elsewhere. What is of interest is the implication it has as to the cultural position of such groups who practice both agriculture and fish drugging. We may infer that these people live in regions suitable to the use of piscicides, that they do not limit their dietary to cultivated foods, but are interested in supplementing it with products of the chase. It drives home the point that settled farmers may practice techniques of food getting which we ordinarily think of as restricted to more primitive culture levels—and the techniques have undergone modification at the hands of the farmers.

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[47] For general data, see Stokes, 1921.

[48] Hamlyn-Harris and Smith (1916, pp. 1-2), who knew of no fish poisoning in New Zealand, attempted to explain the nonoccurrence as possibly due to the presence of boats and fishing gear by an expert fishing people. However, this does not hold for the rest of our large area, so there must be some other explanation. I have found only one reference to fish drugging (with *Lepidium oleraceum* Forst.) in New Zealand (Radlkofer, 1887, p. 402). Fish drugging is apparently uncommon, however, and as a possible explanation I submit the theory that the Maori colonizers of New Zealand did not find suitable plants in their new habitat, or they lacked interest in testing new plants because their other means of fishing were sufficient for their needs. I do not think this problem concerning New Zealand can be answered in general terms—the answer lies probably in specific facts which we do not have on record.

[49] Cf. the words for fish poisoning: In Rarotonga (Cook Islands) it is *hora*; in Hawaii the word is *hola*.

[50] "*Mundulea suberosa* (DC) Benth . . . probably as a result of age-long cultivation has now a very wide range" (Howes, 1930, p. 133).

Madagascar has experienced profound cultural influence from the Malaysian area. The presence of piscicides here may either be due to an Asiatic source, or be derived from the African mainland. The use of piscicides on the Cape Verde and Canary Islands and Madeira is perhaps, though not certainly, ascribable to recent Spanish or Portuguese influence. At any rate, the intra-African occurrences of fish poisoning seem to be continuous and may be, ipso facto, historically connected. There is no concrete evidence of origins in Africa, but (aside from the relatively recent Portuguese and Indonesian connecting links with extra-African cultural areas) the distribution (map 2) suggests the possibility of an independent African origin of fish drugging. Unless we weigh the other possibilities, however, a decision will be hard to reach. Could the use of piscicides have been an ancient, now-forgotten, custom along the lower Nile?[51] Could it have once been connected through coastal Arabia with Persia and India? There are too many possibilities of this kind to allow us a definite opinion. African fish poisoning may be a tropical West African invention, later diffused generally throughout the continent. Or it may have been anciently related to the Euro-Asian occurrences, the former intermediate links not now being in evidence.[52] It is ever hazardous to postulate the loss of simple, uncomplex useful arts in the absence of some concrete proof.[53]

The possibility of independent invention of fish poisoning would seem to be ever present, and in the total absence of archeological evidence of fish drugging, we are not on very firm ground in attempting to solve the particular question concerning African piscicides. It is all too easy to elaborate on a concept after it is known; it is harder to formulate that concept for the first time. Logically, then, we might expect that the presence of fish poisoning would be more often due to historical transmission than to independent invention. The probabilities are theoretically enhanced when we have continuous distributions of single occurrences. Thus, African piscicides would seem to be a related unit, but the question of ultimate origin remains open, as shown above, to at least two possibilities.

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[51] Bates' (1917) exhaustive treatment of ancient Egyptian fishing contains no mention of piscicides. Radcliffe (1921, p. 318) says there is no evidence for Egyptian fish poisoning.

[52] The Sahara Desert region was, as recently as Late Paleolithic and even Mesolithic times, better watered and more fertile. If fish drugging were then present in the Saharan region, we might suspect a connection with Europe (especially Spain and France) which was broken with the advent of the desiccation of North Africa, and with Asia owing to the same phenomenon in Syria-Arabia. (See Childe, 1934, pp. 23–26; Wulsin, 1941, pp. 4–7). Radcliffe (1921, p. 358) after an exhaustive review of the data, concludes the Assyrians did not use poison in fishing.

[53] This theorem holds more for nonmaterial culture which archeology may hardly hope to throw light upon. For example, Killip and Smith (1931, p. 407) say, "At Manaos all agreed that the Indians of the upper Rio Negro and the Rio Branco used plants almost exclusively for fishing." Tessmann (1930, p. 300) states that the Ssabela of northeastern Peru fish only with plant poisons and deny using nets, hooks, or spears. (See also Radcliffe, 1921, p. 318.)

It is theoretically probable that the concept of fish poisoning might spread rather easily and quite rapidly. It is a simple, functional complex which would find ready acceptance[54] because (1) people already know the plants in their own environment which might be applied as piscicides, and (2) it is an uncomplex subsistence technique which yields results with a minimum of labor; in short, it is easy and eminently useful.[55] Then too, primitive groups are liable to come into close contact along waterways and there see and learn about piscicidal techniques.

EUROPE

Fish drugging is apparently a very old practice in Europe. Perhaps the earliest literary reference occurs in Aristotle's Historia Animalium, wherein is mentioned the use of a plant (*Verbascum*) for killing fish. Pliny also notes a plant, probably an *Aristolochia* species, used for drugging fish in Italy (Ernst, 1881, p. 136; Greshoff I, pp. 117–118). Dioscorides notes plants for stupefying fish. For further information on Greek, Roman, and Phoenician fish poisoning, the reader is referred to table 3, and to the special literature.[56] Early European herbals, statutes, plant lists, and pharmacopoeias have all contributed to the knowledge of piscicides in this area.[57] At a very early date, however, laws against fish drugging were instituted [58] and this enlightened attitude toward fish conservation has probably resulted in its being relinquished as a commonly shared culture trait among nearly all European peoples who once practiced it.[59]

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[54] I would emphasize this point of the uncomplex nature of the technique of fish stupefying, since it has a direct bearing on the "diffusibility" of the practice. A trait or complex cannot be easily accepted into a new culture unless the accepting group's culture finds a favorable niche for it. Notwithstanding a possible use or need for it, the culture must be somewhat amenable in order for it to become an integrated feature—otherwise it appears as an excrescence and is likely to be dropped since it is at variance with the rest of the culture-whole.

An illustrative example comes to mind. Whaling, on the northwest coast and in the Aleutian Islands was an important subsistence feature allowing a man to become wealthy and therefore to enjoy high social standing if he controlled the techniques. But whaling was surrounded with secrecy and excessively dangerous (to the uninitiated) ceremonial preparations. It is not hard to see how the whaling complex might have a low index of diffusibility, since the prerogatives of whalers were jealously guarded secrets, and a whale hunter had a decided economic advantage. Whaling in at least part of this area does seem like an excrescence, since it is a monopoly held only by a few individuals; but at the same time, a whale helps the whole community to eat. A complex of this sort, in order to diffuse, must do so by direct contact and personal instruction; fish stupefying, on the other hand, could spread by stimulus diffusion from group to group whose contacts were of the most tenuous sort.

[55] There is some warrant for believing that food-getting techniques or means may spread very widely—note the extensive distribution of maize; the metate; lye-hulling of corn; or hunting techniques such as the impound; or fishweirs. These are found in widely divergent types of culture.

Table 3 gives numerous European occurrences of fish narcotizing.[60] There is not much to discuss, since many of the data are generalized. Clear and specific mentions of piscicides in Asia Minor (Turkey), Persia, or the Caucasus region are rare. The first two areas have large stretches of desert with few fish. If these apparent gaps could be explained away as due to environmental causes, the southern Asiatic piscicide area could be joined to that of Europe and we might relate the whole Euro-Asian occurrences into a grand unit. Until this is proven, however, we shall have to consider the possibility of Europe as a separate area of fish drugging. Northern Europe seems to have had little or no use for piscicides.[61]

NORTH AMERICA

This cannot be considered, a priori, as a separate area, since it connects with South America through Middle America and the

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[56] See Mair's translation of Oppian's Halieutica (Oppian, 1928, Book IV, lines 648 ff. and ftns. a, b, pp. 452–453); Badham, 1854, p. 21; Butler, 1930, pp. 133, 150–51; Radcliffe, 1921, pp. 239–240; Aristotle, 1883, Book VIII, ch. XX, p. 220 (Cresswell translation). These give detailed data on the use of various piscicides (*Verbascum*, *Cyclamen*, *Aristolochia*). There is a possibility, judging from somewhat imperfect evidence, that the Greeks used wine for fish drugging (Butler, 1930, pp. 149–150; Radcliffe, 1921, p. 239, illustration of a mosaic from Melos, pl. opp. p. 240).

[57] Howes, 1930, p. 147, cites Ficalho, who notes a law of 1565 against poisoning fish with plant materials or chalk. This reference to chalk (presumably finely divided like our plaster-of-paris) may refer to lime or it may indicate the use of a "mechanical" piscicide which clogs the gills and suffocates the fish. As late as 1884 there is a mention of the use of lime in securing fish in France (Anon., 1884, p. 186).

[58] Ernst, 1881, p. 136; Greshoff II, p. 162. Frederick II in 1212 prohibited the use of *Taxus* and similar plants in poisoning fish in the Kingdom of Sicily.

[59] I have already suggested (note 32, p. 240) that the use of this method by poachers in the British Isles or on the continent may be a survival, the tradition being maintained among the common people as a means of securing food, while legislation and custom made it impossible for a gentleman to indulge in the practice (Kirby, 1933). The "gentleman" is the man who already has enough to eat—he has leisure to read in Izaak Walton's The Compleat Angler the "correct" method for angling. In other words, here is a survival among the lower classes of a technique which has persisted through need and maintained its function, viz, food getting. On the other hand, the function of angling (which we assume supplanted fish drugging) among the leisure or upper class has changed. Although the fish thus secured *may* be used for food, the primary function has become one of sport. It is not an uncommon end for utilitarian techniques or objects to become of sporting interest among the upper classes. Examples are not difficult to think of—archery, falconry, and game hunting come immediately to mind. In this way, cultural degenerations (i. e., survivals due to the process of what Rivers called the "disappearance of useful arts") are of value in exhibiting cultural processes; they are signposts of culture change. They may often have an irrational basis, another example of the importance of nonutilitarian motives which have been indicated as factors of culture process elsewhere in this paper.

[60] See Howes, 1930, pp. 146–149, for a discussion of European fish poisoning.

[61] There is a single, rather doubtful reference to the use of *Hyascamus niger* L. as a fish poison by the Norwegians (Janus, vol. 10, p. 600, 1905).

Antilles. Despite this general continuity it will be worth while to examine what seem to be the foci of fish drugging in the New World.

CALIFORNIA

Map 2 shows the cartographic position of California piscicides in relation to the world-wide distribution. Map 3 gives the general distribution, in terms of presence or absence, of fish poisoning and fish smoking in the western United States. On the basis of numbers of plants used, I have suggested two centers of development or elaboration. The first includes the Pomo area, where four plants (manroot, turkey, mullein, soaproot, and buckeye) [62] are used. The second center is among the southern Yokuts, where again four plants (buckeye, pepperwood, soaproot, and turkey mullein) are used.

Map 4 gives the main plant forms employed in fish narcotizing, and is based solely on the University of California Culture Element Distribution series.[63] I have omitted plotting on map 4 certain minor or rare occurrences of plants which are listed below.[64]

A comparison of the natural distribution of 12 individual plant species (Jepson, 1925) with the distribution of their cultural use clearly indicates that there is a differential of natural occurrence and cultural utilization, the former being the wider, the latter more restricted. The implication is of possible general significance, particularly in view of parallel examples, in demonstrating that the efficient utilization of the external environment depends on "cultural recognition" of the utilitarian possibilities of what nature offers.[65]

Except in the arid southern desert region, and in northwestern California where the streams are probably too rapid for the use of plant poisons, piscicides are generally employed. Apparently deriving from California are the Intermontane Plateau occurrences on the Owens, Humboldt, and Owyhee Rivers. The few Columbia River groups who claim to have used piscicides probably got their knowledge from farther south, since piscicides are not noted farther north. There is no reason to postulate independent origin of the Columbia River enclave since the Oregon gap to the south is small, the country rather

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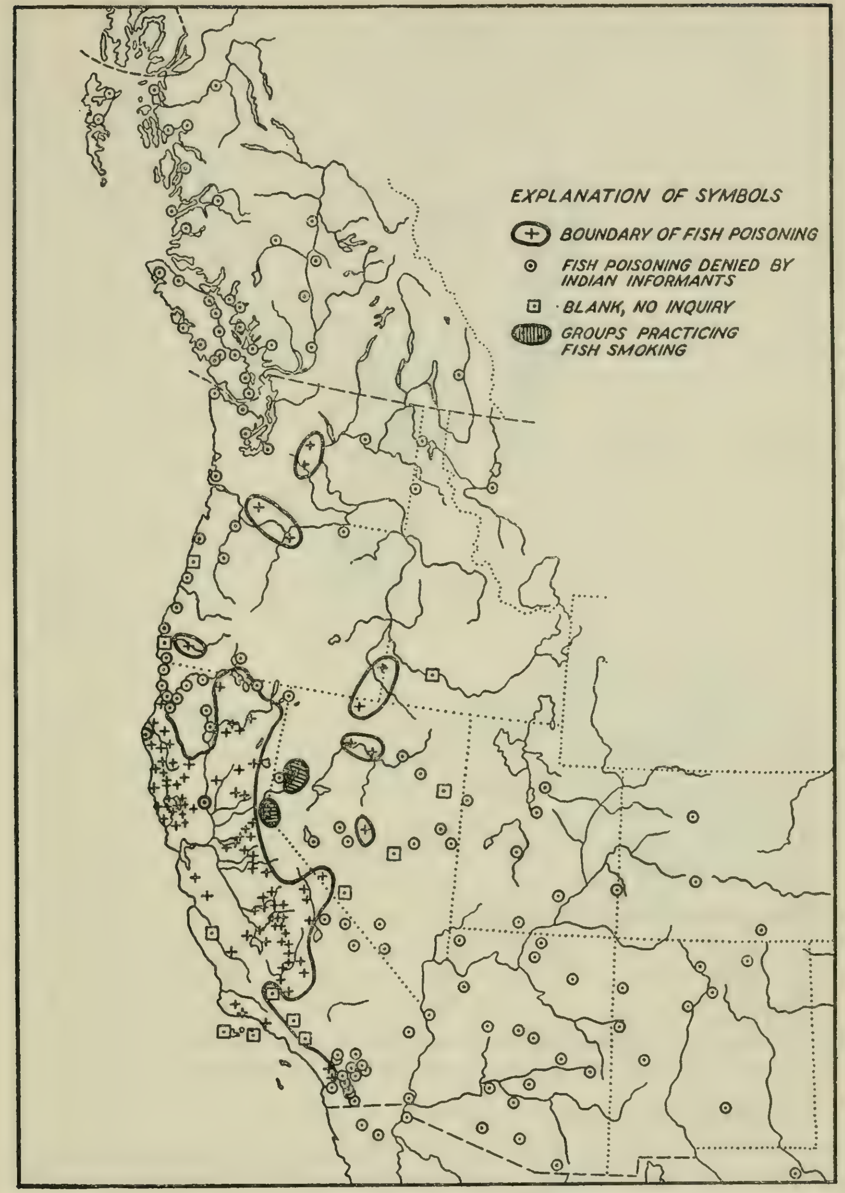
[62] This does not include the putative fish-drugging plant, *Angelica*.

[63] Map 3 may be supplemented by the list given in table 7, which is made up from the ethnographic literature published before the CED survey was instituted. A similar map, together with a valuable discussion, has recently been published by Rostlund (1948).

[64] For location of groups on my maps 3 and 4 and for the groups listed immediately hereafter, see Kroeber's (1939) key and master list. SS (Area I, Pomo), angelica, *Angelica* sp.; SL (Area G, Sinkyone), parsnip; Te (Area D, Tenino), sunflower, *Helianthella* (?) sp.; Mn (Area L, Mono), Mi (Area L, S, Miwok), pepperwood, *Umbellaria californica;* MV (Area K, Maidu), horehound, *Lycopus* sp.; SS, Ic, BW, NE (Area I, Pomo), manroot, *Echinocystis fabacea* (?), or *E. oreganus;* OB (Area M, Paiute), slim solomon, *Smilacina sessilifolia.*

[65] Merrill (1923) shows by a series of maps that the actual botanical distribution of plants used for basketry making in California is consistently wider than their cultural employment. (See also Heizer, 1941.)


EXPLANATION OF SYMBOLS
BOUNDARY OF FISH POISONING
FISH POISONING DENIED BY INDIAN INFORMANTS
BLANK, NO INQUIRY
GROUPS PRACTICING FISH SMOKING

MAP 3.—Distribution of fish-poisoning in western North America.

arid and ethnographic information very scarce.[66] Piscicides in these three culture areas seem to be classifiable as a somewhat discontinuous unit.

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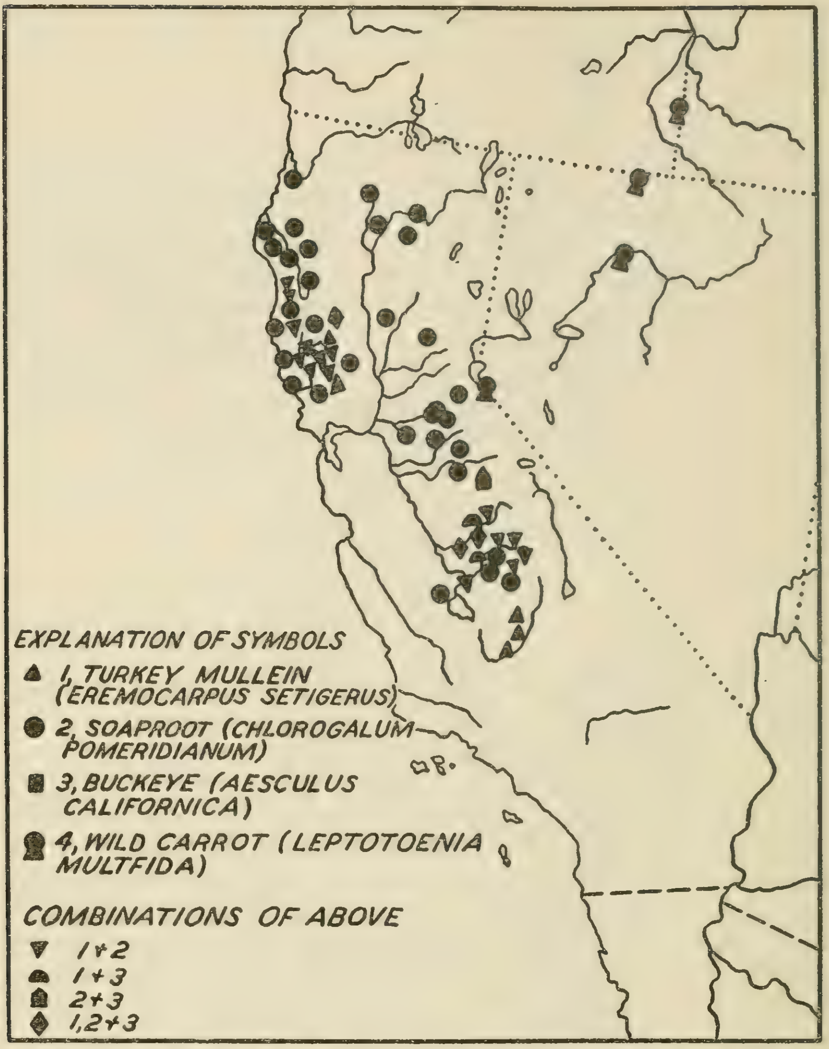
[66] The postulated northward diffusion presumably took the route of the western interior (Willamette Valley).


EXPLANATION OF SYMBOLS
▲ 1, TURKEY MULLEIN (EREMOCARPUS SETIGERUS)
● 2, SOAPROOT (CHLOROGALUM POMERIDIANUM)
■ 3, BUCKEYE (AESCULUS CALIFORNICA)
4, WILD CARROT (LEPTOTOENIA MULTFIDA)
COMBINATIONS OF ABOVE
▼ 1+2
1+3
2+3
◆ 1,2+3

MAP 4.—Distribution of fish-poison plants in western North America.

The unique Great Basin (Nevada) practice of "fish smoking" is of much interest, since it seems to be, in view of its isolation, a local invention. Unfortunately, we lack details as to what type of water body was treated, the plant which was burned, and effects on the fish.

MEXICO AND CENTRAL AMERICA

There is some indication that the western part of northern Mexico generally practiced fish drugging. Table 9 gives the occurrences and plants used. There is little to discuss, since we lack full, specific information. *Hura crepitans* L. is cultivated in Mexico as a fish-poison plant (Rose, 1899, p. 25). This is the most northerly continental cultivation of plants with piscicidal properties in the New World.

Map 2 immediately suggests a problem—are the Mexican and Californian occurrences historically related? There is a definite gap among the Colorado desert Yuman-speaking peoples.[67] The Cocopa employment of willow leaves, which, if used in quantity, produce astringent tannin, may actually be an independent invention.[68] A social factor which may have retarded the spread of the idea of fish drugging is the Southwestern prohibition against eating fish.[69] This taboo is recorded for the Yavapai, Walapai, Havasupai, Hopi, Navaho, Zuni, Western Apache, Mescalero, and Jicarilla Apache (Spier, 1928, p. 123), Wichita (Beals, 1932, p. 167), and Papago (Beals, 1934, p. 13). It is recorded for at least one Great Basin Shoshoni group (Steward, 1943). Here is a great block of people who do not even catch or eat any fish. If the California-Mexican practice of narcotizing fish with poison plants is historically connected, then it either skirted to the west of this noneating area, or it was transferred before the taboo was in operation. The probable route of spread would, in this southwestern area, be mainly along the coast, rather than through the arid interior which has few streams suitable for poisoning.

SOUTHEASTERN UNITED STATES

Fish drugging has a rather restricted distribution in the Southeast.[70] It occurs east of the Mississippi among the following ethnic groups: Yuchi, Creek, Catawba, Cherokee, Choctaw, Delaware, and Iroquois (?).[71] There is a tradition of the former presence of fish poisoning among the Pamunkey, Chickahominy, and Mattaponi.[72]

The use of *Aesculus* nuts as a fish stupefacient suggests a parallel with their relatively common use in parts of California.

Fish poisoning seems to have been unknown between the Intermontane Plateau (Great Basin) and the Mississippi River. The origin of Southeastern piscicides apparently does not lie in the interior of North America—the western Gulf coast literature has failed to yield any mention of fish drugging, and at least one Southern Caddo group (Wichita) claim the taboo against eating fish. The Mexican-Southeastern gap may be a true area of absence, a region which never knew the use of piscicides. If so, we must look either for an independent origin in the Southeast, or to South America via the Antillean route.

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[67] The Cocopa (Yuman-speaking) are an exception (Gifford, 1933, p. 268).

[68] For further discussion, see page 258 of this paper.

[69] In certain parts of the Old World the prohibition against polluting the water may have worked against the adoption of the use of fish poisoning. For a similar type of culture process, see Tschopik (1938). Matthews (1898) has made an interesting study of "ichthyophobia." The fish-eating taboo is practiced in parts of North Africa (Bates, O., 1917, pp. 210–211).

[70] Swanton, 1928, p. 694; Gower, 1927, pp. 26–27; Adair, 1930, p. 432; Flannery, 1939, p. 19.

[71] Handbook of American Indians vol. 1, p. 462, says the Iroquois practiced fish poisoning. Flannery (1939, p. 183), says it is absent among Huron-Iroquois groups.

[72] Flannery, 1939, p. 19; Speck, 1924, p. 191; 1928, pp. 364–65.

ANTILLES

The Greater and Lesser Antillean Islands are only now becoming known from the anthropological standpoint. Loven (1935) has published the fullest single study of the area, and has paid particular attention to possible cultural affiliations with North and South America. Loven states that the Island-Caribs got poison from *conami*, a cultivated herb, and adduces from linguistic evidence that this herb came from the southern mainland and that the Antilles were, "in the matter of fish-poisoning, . . . only a cultural offshoot of South America (Loven, 1935, pp. 423–424). P. Browne[73] says, "The 'Surinam poison' (*Tephrosia toxicaria* Sw. Pers.) has been introduced to Jamaica from the main, and is now cultivated in many parts of the island . . ." Table 8 lists the occurrences of piscicides in the Antillean islands. In view of the certainty of the successive Arawak and Carib migrations into the Antilles from northeastern South America, there is every reason to believe that Loven's conclusion is correct. Since the Southeastern United States area of piscicides does not connect via the Gulf coast with Mexico,[74] it seems likely that it may be historically related to the Antillean (and ultimately South American) area of fish drugging.

SOUTH AMERICA

I might say at the outset that there is so much information on South American piscicides that it has proved beyond the scope of this paper to attempt an exhaustive synthesis. Radlkofer, Greshoff, and Ernst all have long lists of piscicides used in this area. The early explorers (particularly such men as Spix, Martius, and Schomburgk) paid particular attention to this aspect of economic utilization of plants. Nordenskiöld[75] has gone through part of the historical sources and has presented a map. Métraux (1928, map) subsequently enlarged on the work of Nordenskiöld. The best sources on this subject, and as yet nearly untouched by anthropologists, are in the botanical papers on South America.[76] These sources are listed and used by Ernst, Greshoff, Radlkofer, Roark, and Killip and Smith.

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[73] Quoted by Greshoff II, p. 47.

[74] This statement is made with some reservation, since literary source material for the Gulf coast groups (Coahuilteco, Tonkawa, Karankawa, Atakapa, etc.) are few. Those which I have consulted make no mention of fish drugging.

[75] 1920, pp. 40–43, map 6 (p. 45). I believe that fish poisons would be amenable to linguistic treatment of the type done by Nordenskiöld.

[76] See Killip and Smith, 1935; Roark, 1936, 1938.

The use of piscicides seems to be an old culture element in South America. Numerous plants are cultivated, the custom is very widespread, and the number of recorded fish poisons is probably greater than that of any other continent. (See table 10.) I quote from Howes, who says:

> An interesting feature about some of these South American species is that they have not yet been recorded away from the precincts of man, and are known only from aboriginal cultivations, it being common practice among certain tribes to cultivate a few plants round their habitations to supply their wants in fishing. Altson, who has made a special study of these plants in British Guiana, lays emphasis on this fact, and points out that some species never seem to flower. Over a period of some years spent in British Guiana this observer was unable to find certain of these plants in flower or in fruit in spite of a continual lookout being kept and specimens frequently being seen. The following plants are stated to be known only from native habitations in British Guiana: *Clibadium sylvestre* (Aubl.) Baill., *Tephrosia toxicaria* (Sw.) Pers., *Euphorbia cotinoides* Miq., *Phyllanthus* sp. A distribution of this sort courts the assumption that these plants have been under cultivation throughout a considerable period. If this is so, one would expect a wide degree of variation to exist within each species, variation extending also possibly to the degree of toxicity. [Howes, 1930, p. 135.]

That certain plants depended for their existence in some places upon native cultivation is also demonstrated by Chevalier (1925, pp. 1520–1523), who showed that *Tephrosia toxicaria* Pers. must have been more widespread in pre-Contact times. At the time of Plumier's voyage (1689–97) this plant was common in the Antilles, but subsequently became more and more rare and almost disappeared with the extinction of the Caribs. The implication is that without planting and tending by the natives the plant did not propagate itself.[77]

The distribution of fish poisoning for South America shown on map 2 is more or less generalized, but it is necessarily so. For a spot-map of South America, those of Nordenskiöld and Métraux will do very well.

It is unnecessary to emphasize that map 2 exhibits a continuous distribution from South America through Central America to northern Mexico, and from South America through the Antilles to the southeastern United States. It is difficult to avoid the conclusion that we are dealing with a single, widely distributed concept which has a South American focus of origin, dispersal center, and highest, or most complex, development.[78]

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[77] This is the case with the banana which is planted, not from seeds, but from "slips" or "sets." This is a specialization of long cultivation, the plant being unable to propagate itself naturally and without human interference. It is, in biological terms, a symbiotic relationship brought about through cultivation by man over a long period of time. A situation of this sort implies some antiquity for the use of piscicides. (Cf. Howes, 1930, p. 135; Cook, 1925.)

[78] Métraux (1928, p. 93) says, "Fishing with the aid of poison is not practiced by the Tupí-Guaraní of the Upper Xingu, which seems to indicate that this procedure has been discovered at a recent date, probably in the Amazon basin." This conclusion seems questionable, since cultivation of piscicidal plants and the wide distribution of the practice indicate fish poisoning is an old South American cultural feature. A more likely explanation is either that these Tupí-Guaraní did not choose to practice fish stupefying, or that certain environmental features militated against the practice.

SUMMARY

THE OLD WORLD

In the particular sections of analyses of distribution it is intimated that the Euro-Asian occurrence of fish drugging, notwithstanding the apparent Turko-Iranian discontinuity, is probably a historical unit. Australian fish poisoning may have been diffused first to Queensland from Melanesia. Oceanian fish stupefying was probably borrowed from an ultimate continental Asiatic source through the intermediate Indonesian route. Africa seems either to have developed piscicides independently, or to have shared, at an earlier time, the concept with the north (Europe), or to have borrowed it from the east. External influence has profoundly affected much of African culture, and fish drugging may possibly be a custom originally learned from peoples outside that continent, subsequently became enlarged and elaborated, and later was diffused widely within the continent.

It remains now to attempt to explain the large areas in the Old World in which fish drugging is lacking. If it is admitted that fish drugging in the Old World had a unitary origin and subsequent diffusion which is approximated on map 2, then the reason for absence is simply that the concept did not spread there. But there are factors (environmental, cultural, or both) which condition diffusion and it is possible to give reasons to account for certain blank spots on the distribution map.

In a recent paper, Findeisen,[79] states that there is no record of fish poisoning among the Siberian tribes. This categorical dismissal of the presence or absence is open to question, for there are certain references, however inexact, to piscicides in Siberia. Radlkofer (1887, p. 409) notes that in Siberia *Rhododendron dauricum* L. is used as a piscicide. Northern Asia is mentioned as the location of the piscicidal use of *Daphne mezereum* L., but since Europe is also mentioned, this Asiatic occurrence may be in northwestern Russia (Radlkofer, 1887, p. 412). *Verbascum phlomoides* L. and *V. thapsiforme* are noted as piscicides "in verschiedenen Teilen des Russischen Reiches" and "in het gouvernement Moskou" (Greshoff III, p. 144). The implication here is that extreme western Russia is meant—the possibility of European influence is a logical explanation for the presence of fish poisoning here. A likely factor militating against the use of piscicides in the far north is proposed by von Middendorf, who says:

> Ein grosser Vorzung den der Norden besitzt, is der, dass keine Giftpflanzen zu ihm hinanreichen. Mir is nur ein einziges Beispiel einer für giftig erkannten hoch Nordischen Pflanze bekannt, indem Hed. Mackenzii (*Hedysarum mackenzii*

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[79] Findeisen, 1929, p. 18. The area and tribes considered by this author will be found on p. 4.

Richards.) brechenerregend erklärt wird und in einem Fall fast tödtliche Zulfalle hervorrief. [Von Middendorf, 1867, vol. 4, p. 697.]

This is a statement of real significance, for it offers a possible explanation for the absence of fish poisoning in Asia north of 40° latitude.[80] Without proper plants with which to stupefy fish, people could neither invent fish poisoning, nor accept the concept if they had the opportunity to learn of it from others who practiced the use of piscicides. It will occur to the reader that fishing in general is of tremendous importance to the northern peoples in Asia.[81] But a whole series of mechanical techniques are here applied to securing fish—weirs, nets, hook-and-line, harpoons, and spears. These are methods which take the place of fishing with poison.

There is no reason to believe that the fish-drugging technique has ever been present in the blank area of northeastern Asia shown on map 2. Thus, the question of Old World introduction into North America cannot be raised. Where the place of origin of the practice of fish poisoning in the Old World was, or when the origination took place there is no way of telling.

THE NEW WORLD

The main point which I have attempted to bring out in the analysis of the distribution of fish drugging in the New World is that, with minor and generally explainable exceptions, the distribution is continuous.

Since the area within which this practice is carried on in the New World is a large, single, and connected one, I see no reason to doubt a unitary origin and a dispersal from some focus. When this diffusion took place there is no way of telling. It is clear, however, that the wide geographical extension and the numerous local specializations of the use of piscicides indicate a cultural element of some antiquity.[82] The fons et origo of New World piscicides could hardly have been in the Old World—the gap is too broad between the recent Asiatic and American occurrences. Everything points to tropical South America with its many well-stocked fishing streams and superabundance of wild plants with piscicidal potentialities as the fountainhead. The general area in South America in which I believe the use of piscicides may have originated is indicated on map 2.

Assuming a northern South American origin, we can visualize the use of fish poisons slowly spreading to the south and north. Southern South America (at about 37° S. latitude) seems to be the southern limit, with the exception of the Chilean occurrence which probably spread down the coast. Piscicides probably traveled northward through the Lesser Antilles, the Greater Antilles, and into the southeastern United States, but did not diffuse east of the Mississippi River or north of the Ohio except along the coastal strip occupied by the southeastern Algonkians. Fish drugging may or may not have reached the Iroquois of New York State.

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[80] For further data on seasonal, locational, and climatic conditions affecting the toxicity of plants, see Pammel (1911, pp. 83-85), Howes (1933), Cornevin (1887, p. 214).

[81] For a good discussion of this, see Birket-Smith (1929), Findeisen (1929).

[82] Beals (1932, p. 104), on the basis of few cited data, proposes fish stupefying as an "old American substratum trait."

A northwestward diffusion from South America introduced the practice of fish drugging in Middle America. The intensive agriculturists seemed to have had little regard for its use, and it again becomes an important subsistence method north of the Valley of Mexico in the western slopes of the highland and the west coast. The impulse was barely recorded in Baja California. The important question of the possible southern derivation of Californian fish poisoning is hard to decide. Between the Colorado River and southern California coast is a desert area in which, in all probability, fish poisoning has never been practiced. But aboriginal cultural contacts and diffusion across the southern California desert are known, and it seems not unlikely that through such contacts the knowledge and use of fish-poison plants may have been spread. Perhaps the introduction was via the coast northward from Baja California to littoral southern California and from thence to the Interior Valley and into the Great Basin.[83] Whatever the actual case, I am reluctant to point out California as a truly isolated area of autochthonous origin and development of piscicides, particularly since the discontinuity of distribution is actually quite small. After all, fish drugging apparently was distributed through the arid Great Basin area and sporadically through the more or less uncongenial region of central Oregon as far north as the Columbia River.

Fish poisoning seems to have a sharply defined northern limit in North America—I can find no evidence of piscicides on the northwest coast,[84] Mackenzie Basin,[85] or Alaskan areas. This seems to be an area which does not, and presumably never did, use piscicides.

In this light, fish poisoning clearly seems to have originated within the New World independently of any other developments in the rest of the World.[86]

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[83] There is, however, no record of Cochimi, Kiliwa, or Akwa'ala fish drugging in whose territories there are no suitable watercourses.

[84] The University of California Culture Element Distribution Studies attest solid negatives for fish poisons in the northwest coast area.

[85] The late Dr. J. M. Cooper told me that none of the northern Algonkians know fish poisoning.

[86] Vellard (1941, pp. 94, 106) says of South America fish poisoning, "C'est un nouveau point de contact a signaler entre les regions indo-malaises at americaines." There seems to me no warrant for proposing a transoceanic diffusion of fish drugging to the New World. Trans-Pacific diffusionists may find a basis for argument in the South American name of *Lobelia tupa* L. of "tupa" in Peru and Chile, which is close to the general Malaysian word of "tuba," referring to fish-poison plants (Greshoff I, p. 94). A single instance of this sort can, however, be only of limited significance.

NOTES ON THE TABLES

In the following tables will be found listed, according to geographical area, plants used as piscicides. These lists are not complete, and give only a sampling of the plants used and places where piscicides are employed. Although drawn largely from the lists given by Ernst, Radlkofer, Greshoff, and Howes, my lists contain supplementary material which has been culled from ethnographic accounts.

Each entry is accompanied by a bibliographic citation, often to a secondary source which in turn will give reference to the original or primary source.

In a general study of this sort, mention should be made of the sources from which the working data have been drawn. No anthropologist seems to have ever attempted the truly formidable task of collecting *all* data on piscicides from primary source materials. Such sources are extremely varied—botanists' reports, plant lists, explorers' journals, and ethnographic accounts. There are, however, a number of treatments by botanists of fish-poison plants. Ernst (1881), Radlkofer (1887), Greshoff (I, 1893; II, 1900; III, 1913), Hamlyn-Harris and Smith (1916), and Howes (1930) have been the main contributors in this respect. These papers all have the status of secondary sources, since they are syntheses or abstracts of primary references. My justification for placing chief reliance on these secondary sources is that the original papers are in large part difficult or impossible to consult: references are often in the form of verbatim quotations, and are always accompanied by source citation. Such secondary authorities are of a very high grade.

For the convenience of those who have the occasion to consult the main sources utilized for this study, there is presented on pages 232 and 233 the references in these works to (1) botanical lists, (2) source lists of genera containing certain plant toxins, (3) the bibliographies in the works of these authors dealing with fish-poison plants, and (4) folk names of fish-poison plants.

TABLE 1.—*Distribution of fish-poison plants in southern Asia and Indonesia*[1]

Area	Plant	Part used	References
Armenia	*Rhododendron caucasicum* Pall		Greshoff I: 95–96.
Persia[2]	*Anamirta* sp		Greshoff II: 120.
	Anamirta paniculata Colebr	Berries	Greshoff II: 13.
Arabia[2]	*Tephrosia tomentosa* Pers		Radlkofer, 1887: 405.
	Balanites roxburghii Planch	Bark	Greshoff I: 29.
	Anamirta paniculata Colebr	Berries	Greshoff II: 13–15.
Iraq	*Anamirta paniculata* Colebr		Greshoff II: 14.
Yemen	*Anamirta paniculata* Colebr	Fruit	Do.
Palestine	*Anamirta paniculata* Colebr	do	O. Mason, 1895: 299.
	Cyclamen latifolium Sibth. and Sm.	Root	Hornell, 1941: 126–127.
	Styrax officinalis L	Seeds	Do.
	Verbascum sinuatum L	Plant	Do.
North India	*Zanthoxylum alatum* Roxb	Bark, fruit	Greshoff II: 29-30.

[1] For full data on Malaysia, see Hickey, 1950, and Rumphius, 1750-1755.
[2] Introduced from the West Indies.

TABLE 1.—*Distribution of fish-poison plants in southern Asia and Indonesia*—Continued

Area	Plant	Part used	References
East India	*Hydnocarpus laurifolia* (Dennst.) Sleumer.	Fruit	Radlkofer, 1887: 402.
	Derris uliginosa (Roxb.) Benth	Roots	Radlkofer, 1887: 407.
	Nicotiana tabacum L		Radlkofer, 1887: 411.
Central India	*Terminalia bellerica* Roxb	Bark	Greshoff II: 75.
	Strychnos nux-vomica L	Seeds	Greshoff I: 106.
West India	*Tetracera assa* DC	Bark	Radlkofer, 1887: 401.
	Anamirta cocculus Wight and Arn	Fruit	Do.
	Walsura piscidia Roxb	Bark, fruit	Radlkofer, 1887: 402; Raizada and Varma, 1937: 206
	Bignonia capreolata L		Radlkofer, 1887: 412.
Punjab	*Euphorbia royleana* Boiss	Juice	Khan, 1930: 193.
India	*Tinospora cordifolia* Miers	Bark	Raizada and Varma, 1937: 204.
	Schima wallachii Chois	do	Raizada and Varma, 1937: 205.
	Balanites roxburghii Planch	do	Do.
	Sapindus trifoliatus L	Fruit, root	Raizada and Varma, 1937: 206.
	Acacia pennata Willd	Fruit, stem	Do.
	Albizzia procera Benth	Bark	Do.
	Caesalpina nuga Ait	Fruit, stem	Raizada and Varma, 1937: 207.
	Dalbergia stipulacea Roxb	Bark, root	Do.
	Derris elliptica Benth	Root	Do.
	Entada scandens Benth	Seed	Do.
	Millettia pachycarpa Benth	Root	Raizada and Varma, 1937: 208.
	Mimosa himalayana Gamble	Bark	Do.
	Ougeinia dalbergioides Benth	do	Do.
	Pithecolobium bigeminium Benth	Leaves, bark, seed.	Do.
	Pongamia glabra Vent	Seed, root	Raizada and Varma, 1937: 209.
	Tephrosia candida DC	Roots, leaves	Do.
	Caesaria graveolens Dalz	Fruit	Raizada and Varma, 1937: 210.
	Artemesia vulgaris L	Leaves, bark	Do.
	Eupatorium odoratum L.[2]	Plant	Do.
	Rhododendron falconeri Hook. f	Flower beds	Do.
	Anagallis arvensis L		Raizada and Varma, 1937: 211.
	Cyclamen persicum Miller	Root	Do.
	Maesia indica Wall	Leaves, bark	Do.
	Bassia latifolia Roxb [2]	Seeds	Do.
	Diospyros montana Roxb	Fruit	Do.
	Melodinus monogynus Roxb	Bark	Raizada and Varma, 1937: 212.
	Nerium odorum Solander	Bark, root	Do.
	Asclepias curassavica L.[2]	Plant	Do.
	Verbascum thapsus L	Seeds	Do.
	Dolichandrone falcata Seem	Bark	Do.
	Eremostachys vicaryi Benth	Plant	Raizada and Varma, 1937: 213.
	Lasiosiphon ericephalus Dcne	Leaves, bark, root.	Do.
	Linostoma decandrum Wall	Fruit, stem	Do.
	Croton tiglium L	Fruit	Do.
	Euphorbia tirucalli L	Juice	Do.
	Flueggia leucopyrus Willd	Bark, leaves	Raizada and Varma, 1937: 214.
	Sapium indicum Willd	Seeds	Do.
	Antiaris toxicaria Lesch	Juice	Do.
	Cannabis sativa L	Stem, leaves, flowers.	Do.
	Juglans regia L	Unripe fruit rind.	Raizada and Varma, 1937: 215.
	Myrica nagi Thunb	Bark	Do.
	Gnetum scandens Roxb	Leaves	Do.
	Taxus baccata L	Leaves, branches	Do.
	Corypha umbraculifera L	Fruit	Do.
	Anamirta paniculata Colebr	Berries	Greshoff II:13.
	Randia dumetorum Lam	Fruit	Howes, 1930:141; Raizada and Varma, 1937: 210.
	Gynocardia odorata R. Br	Fruit, leaves, bark.	Raizada and Varma, 1937: 204.
	Barringtonia acutangula (L.) Gaertn.	Fruit, bark, root.	Raizada and Varma, 1937: 209.

TABLE 1.—*Distribution of fish-poison plants in southern Asia and Indonesia*—Continued

Area	Plant	Part used	References
India	*Cleistanthus collinus* (Roxb.) Benth. and Hook.	Bark	Howes, 1930:141; Hooper, 1898.
	Fluggea leucopyrus Willd	do	Greshoff III:87.
	Zanthoxylon alatum Roxb	Seeds, bark	Khan, 1930:193; Raizada and Varma; 1937:205.
	Casearia tomentosa Roxb	Seeds	Khan, 1930:193.
South and West India	*Mundulea suberosa* (DC.) Benth	Bark, seeds	Howes, 1930:133; Greshoff I:56–57.
Ceylon	*Hydnocarpus venenata* Gaertn		Greshoff II:21; I:19–20.
	Pachygone ovata Miers		Radlkofer, 1887:402.
	Dioscorea bulbifera L	Root	Greshoff III:28.
	Derris scandens Benth	Plant	Greshoff III:74.
	Derris benthamii Thwaites	Root	Stockdale, 1928:78–79.
Travancore	*Diospyros montana* Roxb	Fruit	Howes, 1930:141.
Hindustan	*Crinum asiaticum* L	Leaves, roots	Greshoff II:151.
Sikkim	*Gynocardia odorata* (Roxb.) R. Br	Fruit	Greshoff I:19; II:21.
	Bassia butyracea Roxb	Bark	Greshoff II:101.
Nepal	*Zanthoxylum alatum* Roxb	Seeds	Greshoff I:28.
Assam	*Myrica nagi* Thunb	Bark	Greshoff II:146.
	Millettia piscidia (Roxb.) Wight and Arn.	Bark, flowers	Greshoff, I:54.
Burma	*Hydnocarpus castanea* Hook f. and Th.	Fruit	Greshoff II:21–22.
	Tephrosia candida DC	Leaves	Greshoff II:48; Howes, 1930:140.
	Acacia pruinescens Kurz	Bark	Greshoff II:69; F. Mason, 1883: vol. 2, p. 543.
	Spilanthes paniculata DC		F. Mason, 1883: vol. 2, p. 380.
Perak, Selangor	*Derris ellipitica* (Roxb.) Benth	Root	Skeat and Blagden, 1906: vol. 1, pp. 211, 213; Harris. 1925.
Bengal	*Tephrosia candida* DC	Leaves	Greshoff II:48.
Cochin China	*Anamirta paniculata* Colebr	Berries	Greshoff II:13.
Malakka	*Hydnocarpus castanea* Hook f. and Th.	Fruit	Greshoff II:21–22.
Andaman Islands	*Hydnocarpus castanea* Hook f. and Th.	do	Greshoff II:21–22.
	Lagerstroemia sp	Seeds	Man, 1883:366.
Nicobar Islands	*Barringtonia asiatica* (L.) Kurz	do	Kloss, 1903:246.
Malaya	*Diospyros toposioides* King and Gamble.	Fruit	Howes, 1930:141.
	Derris elliptica (Roxb.) Benth	Roots	Evans, 1937:219; Martin, 1905:792; G. Maxwell, 1907: 246–64; Ishikawa, 1916; Wray, 1892.
Java	*Millettia dasyphylla* (Miq.) Boerl		Greshoff III:69.
	Pittosporum javanicum Bl	Fruit	Greshoff II:22.
	Hydnocarpus heterophylla Bl		Radlkofer, 1887:402.
	Millettia sericea Wight and Arn	Stalk, leaves	Radlkofer, 1887:406.
	Derris uliginosa (Roxb.) Benth	Root	Radlkofer, 1887:407.
	Cocculus indicus		Raffles, 1830:208–209.
	Albizzia stipulata Boiv	Bark	Radlkofer, 1887:408.
Sumatra	*Millettia sericea* Wight and Arn	Roots	Greshoff II:49–51.
	Polygonum erythrodes Miq	Sap	Greshoff III:35.
	Symplocos racemosa Roxb	Bark	Greshoff III:129.
	Derris sp	Roots	Marsden, 1811:186.
Timor, Alor	*Barringtonia racemosa* (L.) Bl		Greshoff II:176.
	Derris elliptica (Roxb.) Benth		Greshoff II:174–75.
Celebes	*Callicarpa longifolia* Lam	Leaves	Greshoff II:180–81.
	Barringtonia asiatica (L.) Kurz	Fruit	Greshoff II:176.
	Millettia sericea Wight and Arn	Roots	Greshoff II:173.
	Anamirta paniculata Colebr	Fruit	Greshoff II:169.
	Croton tiglium L	do	Howes, 1930:141.
Borneo		Roots	Hose and McDougall, 1912: 139–140.
	Derris elliptica (Roxb.) Benth	do	H. L. Roth, 1896:458–460; Furness, 1902:185–89; Mjoberg, 1930:100–102; Nieuwenhuis, 1904:192–196.
Moluccas	*Euphorbia neriifolia* L		Radlkofer, 1887:413.
	Abrus pulchellus Wall		Radlkofer, 1887:406.
	Aegiceras minus Gaertn	Bark	Radlkofer, 1887:409.
Ceram	*Phyllanthus distichus* Muell	Roots	Greshoff II:182.
Philippines	*Croton tiglium* L	Fruit	Howes, 1930:141.
	Diospyros sp	do	Do.
	Harpullia arborea (Blanco) Radlk		Radlkofer, 1887:405.
	Diospyros ebenaster Retz	Fruit	Radlkofer, 1887:410.
	Maesa denticulata Mez		Greshoff III:125.

Table 1.—*Distribution of fish-poison plants in southern Asia and Indonesia*—Continued

Area	Plant	Part used	References
Philippines	*Entada phaseoloides* (L). Merr	Stalk	Greshoff III:62.
	Derris elliptica (Roxb.) Benth	Roots	W. H. Brown, 1921:79.
	Derris philippinensis Merr	do	Do.
	Derris trifoliata Lour	do	Kalaw and Sacay, 1925.
	Galactia sp	Bark	Blair and Robertson, 1903–09: vol. 43, p. 273.
	Anamirta cocculus Wight and Arn.	Fruit	Do.
	Euphorbia pilulifera L	Plant	Blair and Robertson, 1903–09, vol. 48, p. 122.
	Albizzia saponaria (Lour.) Bl	Bark	Greshoff III:61.
	Albizzia acle (Blanco) Merr		Do.
	Pachygone ovata Miers	Fruit	Greshoff II:16.
	Derris polyantha Perk		Greshoff III:74.
	Derris elliptica (Roxb.) Benth		Greshoff III:78.
	Ganophyllum falcatum Bl	Bark	Greshoff III:83.
	Barringtonia balabacensis Merr		Greshoff III:117.
	Datura metel L	Plant	Greshoff III:139-140.
	Gliricidia sepium (Jacq.) Steud		Greshoff I:67, 70; II, 51.
Singapore	*Derris elliptica* (Roxb.) Benth		Radlkofer, 1887:407.
Cochin China	*Crinum asiaticum* L	Leaves, roots	Greshoff II:151.
Coromandel	*Grewia asiatica* L		Radlkofer, 1887:402.
Kei Islands	*Millettia sericea* Wight and Arn	Plant	Greshoff I:57.

Table 2.—*Distribution of fish-poison plants in Oceania*[1]

Area	Plant	Part used	Reference
Marianas Islands	*Barringtonia asiatica* (L.) Kurz	Juice	Howes, 1930: 143.
Caroline Islands	*Derris elliptica* (Roxb.) Benth		Greshoff II: 62.
New Britain	*Barringtonia asiatica* (L.) Kurz		Howes, 1930: 143–144.
Mentawai Islands	*Derris elliptica* (Roxb.) Benth		Pleyte, 1901: 7.
Bismarck Archipelago.	*Barringtonia asiatica* (L.) Kurz		Howes, 1930: 143–144.
Torres Straits (Mabuiag).	*Derris uliginosa* Benth	Roots	Hamlyn-Harris and Smith, 1916: 11.
	Tephrosia purpurea Pers	Plant	
New Caledonia	*Orobus piscidia* Spr. (?)		Radlkofer, 1887: 406.
	Calophyllum montanum Vieill		Greshoff II: 24.
Solomon Islands	*Barringtonia* sp	Fruit	Kloss, 1903: 246.
New Guinea	*Harpullia thanatophora* Bl	Bark	Radlkofer, 1887: 404.
	Derris elliptica (Roxb.) Benth	Roots	Van der Sande, 1907: 170.
Samoa	*Barringtonia asiatica* (L.) Kurz	Fruit, bark	Buck, 1930: 443–444; Setchell, 1924: 214.
	Phyllanthus simplex Retz		Greshoff III: 88.
	Ipomoea sp. (?)		Churchill, n. d.: 122.
	Tephrosia purpurea (L.) Pers	Root, plant	Buck, 1930: 443–444.
Society Islands	*Lepidium bidentatum* Montin		Greshoff II: 18.
	Tephrosia purpurea (L.) Pers	Plant	Ellis, 1853: 140.
	Wikstroemia foetida (L. f.) A. Gray		Stokes, 1921: 231.
New Zealand	*Lepidium oleraceum* Forst. (?)		Radlkofer, 1887: 402.
Hawaii	*Piper methysticum* Forst	Plant	Greshoff II: 132.
	Cocculus ferrandianus Gaud	Seeds	Greshoff II: 16. Bryan, 1915: 341–342.
	Tephrosia purpurea (L.) Pers	Plant	Stokes, 1921: 226.
	Wikstroemia spp	do	Do.
	Lagenaria siceraria (Mol.) Standl	Fruit	Do.
	Colubrina asiatica Brongn		Rock, 1913: 283.
Viti Islands (Fiji)	*Derris trifoliata* Lour	Stem, leaves	Greshoff I: 71: II: 61; Hornell, 1941: 127.
	Barringtonia asiatica (L.) Kurz		Greshoff I: 71; II: 62; Seemann, 1862:339.
Marquesas Islands	*Derris malaccensis* Prain	Root (?)	Hornell, 1941: 127–128.
	Tephrosia purpurea (L.) Pers		Do.
	Pittosporum sp		Do.
	Derris trifoliata Lour	Stem, leaves	Seemann, 1862: 339.
	Barringtonia asiatica (L.) Kurz	Fruit	Handy, 1923: 178.
Rarotonga	*Barringtonia asiatica* (L.) Kurz	Kernel	Buck, 1928.
Tahiti	*Barringtonia asiatica* (L.) Kurz	Nuts	Ellis, 1859: 140; H. St. John, information.
Guam	*Barringtonia asiatica* (L.) Kurz	Fruit	Safford, 1917 b: 81–82.
Loyalty Islands	*Cerbera manghas* L	Fruit (?)	Sarasin, 1929: 83.
	Euphorbia sp	Sap	Do.
	Barringtonia asiatica (L.) Kurz	Fruit (?)	Do.
	Desmodium sp		Do.

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[1] For general data see Stokes, 1921; Buck, 1928; C. F. Maxwell, 1912.

TABLE 3.—*Distribution of fish-poison plants in Europe and northern Asia*

Area	Plant	Part used	Reference
Northern Europe	*Digitalis thapsi* L.		Radlkofer, 1887:412.
	Verbascum nigrum L.	Seeds	Greshoff I:110.
Europe	*Agrostemma githago* L.	do	Greshoff III:39.
	Euphorbia esula L.		Howes, 1930:148:Radlkofer, 1887:413.
	Euphorbia platyphylla L.		Radlkofer, 1887:413.
	Taxus baccata L.		Radlkofer, 1887:415.
	Cyclamen europaeum L.		Radlkofer, 1887:409.
	Cyclamen graecum Link		Do.
	Verbascum thapsus L.		Radlkofer, 1887:411.
	Verbascum phlomoides L.	Plant	Do.
	Anamirta cocculus Wight and Arn.	do	Krause, 1904:131.
England	*Euphorbia hiberna* L.	Leaves	Greshoff I:127.
	Euphorbia coralloides L.		Greshoff II:136.
Ireland	*Euphorbia hiberna* L.	Leaves	Greshoff I:127; Aristotle, 1883 (1910 ed.): 602.
Southern Ireland	*Euphorbia coralloides* L.		Greshoff II:136.
France (Bretagne)	*Anamirta cocculus* (L.) Wight and Arn.	Berries	Anonymous, 1884:186.
	Anamirta paniculata Colebr.	Plant	Greshoff II:14.
Germany	*Verbascum thapsoides* Willd.	Seeds	Radlkofer, 1887:411.
	Aconitum sp.		Greshoff II:122.
	Schrophularia sp.		Do.
Southern Europe	*Euphorbia lathyris* L.		Radlkofer, 1887:413.
	Euphorbia amygdaloides L.		Howes, 1930:148; Radlkofer, 1887:413.
	Cicer arietinum L.	Plant	Greshoff III:77.
Italy	*Verbascum thapsus* L.		Howes, 1930:147.
Sicily	*Cyclamen europaeum* L.	Tubercles	Greshoff II:126.
Sardinia	*Daphne gnidium* L.	Roots	Howes, 1930:147; Greshoff III:115.
	Oenanthe crocata L.	do	Howes, 1930:148; Greshoff III:122.
Portugal	*Verbascum crassifolium* Lam. and DC.		Howes, 1930:147; Greshoff II:119.
	Daphne sp.		Howes, 1930:147.
	Anamirta paniculata Colebr.		Do.
	Oenanthe crocata L.	Root	Howes, 1930:148.
Spain	*Daphne cneorum* L.	Leaves, fruit	Radlkofer, 1887:413.
	Hyoscyamus niger L.		Radlkofer, 1887:411.
	Euphorbia hiberna L.	Plant	Radlkofer, 1887:413.
	Daphne gnidium L.		Do.
	Veratrum album L.		Radlkofer, 1887:415.
	Verbascum sp.	Plant	Howes, 1930:147.
Constantinople	*Verbascum sinatum* L.		Howes, 1930:148.
Greece	*Verbascum phlomoides* L.	Seeds	Greshoff I:109; Howes, 1930:146.
	Verbascum sinuatum L.	do	Howes, 1930;146.
	Anchusa (*italica* Retz)=*azurea* Mill.		Greshoff III:135.
	Euphorbia dendroides L.	Bark, leaves	Howes, 1930:148: Greshoff III:95.
	Euphorbia characias L.		Howes, 1930:148.
	Euphorbia sibthorpii Boiss.	Bark, leaves	Radlkofer, 1887:414.
Caucasus	*Rhododendron caucasicum* Pall.		Greshoff I:95-96.
Sibera	*Rhododendron dauricum* L.		Radlkofer, 1887:409.
Russian Empire (Moscow).	*Verbascum phlomoides* L.		Greshoff III:144.
	Verbascum thapsiforme Schrad.		Do.
Russia	*Taxus baccata* L.	Leaves	Greshoff III:12.
Northern Asia	*Daphne mezereum* L.		Radlkofer, 1887:412.

TABLE 4.—*Distribution of fish-poison plants in eastern Asia*

Area	Plant	Part used	Reference
Northern China	*Wikstroemia chamaedaphne* Meissn.		Greshoff II:134.
Southern China	*Euphorbia pulcherrima* Willd.		Greshoff II:138.
China [1]	*Melia azedarach* L.		Greshoff II:118, 138.
	Datura fastuosa L. var. *alba* (Nees) C. B. Clarke.		Greshoff II:118.
	Canarium sp.	Fruit	Greshoff II:31.
	Camellia sp.		Greshoff I:24.
Japan	*Buddleia curviflora* Hook. and Arn.	Leaves	Greshoff III:130.
	Dioscorea tokoro Makino	Roots	Greshoff III:28.
	Zanthoxylum piperitum DC.	Leaves	Greshoff III:82; I:26.
Formosa	*Milletia taiwaniana* Hayata	Roots	Kariyone et al., 1923.

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[1] For further data see Greshoff II, p. 134, footnote 1.

TABLE 5.—*Distribution of fish-poison plants in Africa*

Area	Plant	Part used	Reference
South Africa	*Tephrosia macropoda* Harv	Roots	Howes, 1930: 133.
Natal	*Millettia caffra* Meissn		Radlkofer, 1887: 406.
Northeastern Transvaal.	*Adenium multiforum* Kl		Howes, 1930: 134.
Mozambique	*Tephrosia ichthyoneca* Bertol		Radlkofer, 1887: 406.
	Tephrosia vogelii Hook. f		Radlkofer, 1887: 405.
Zambezi River	*Derris uliginosa* (Roxb.) Benth	Stems	Greshoff I: 71.
Zanzibar	*Cynanchum sarcostemmatoides* K. Sch.		Greshoff III: 133.
	Euphorbia tirucalli L	Sap	Ingrams, 1931: 300; Greshoff III: 96.
Angola	*Tephrosia vogelii* Hook f.	Leaves	Greshoff II: 49; Hambly, 1934: 145.
Cameroons, French Equatorial Africa.	*Tetrapleura thonningii* Benth	Seeds	Tessmann, 1913: 111–112.
	Ophiocaulon cissampeloides Mast	Leaves, stem	Do.
	Adenia lobata Engl	do	Do.
	Justicia extensa T. Anders	Leaves	Do.
	Piptadenia africana Hook. f	Bark	Do.
	Rinorea dentata (Beauv.) Kuntze	do	Do.
	Pachyclasma tessmanii Harms		Do.
Belgian Congo	*Tephrosia toxifera*	Plant	Weeks, 1913: 242–243.
	Euphorbia sp		
French Congo	*Tephrosia vogelii* Hook. f	Leaves	Avelot and Gritty, 1913: 6.
	Tetrapleura thonningii Benth	Seeds	Do.
Nigeria	*Ophiocaulon cissampeloides* Mast	Stem	Howes, 1930: 133.
	Adenium honghel A. DC	Root	Howes, 1930: 134.
	Tephrosia vogelii Hook. f		Greshoff I: 52–53.
	Mundulea suberosa (DC.) Benth	Bark, seed	Howes, 1930: 133.
Guinea	*Tephrosia vogelii* Hook. f		Radlkofer, 1887: 405.
Liberia	*Leucaena odoratissima* Hassk		Radlkofer, 1887: 408.
Gold Coast	*Elaeophorbia drupifera* Stapf	Leaves, fruit	Howes, 1930: 134.
Ivory Coast	*Strychnos aculeata* Solered	Fruit	Greshoff III: 130.
West Africa	*Erythrophleum guineense* G. Don	Bark	Howes, 1930: 133.
	Cassia sieberiana DC	Ponds	Do.
	Chailletia toxicaria G. Don		Radlkofer, 1887: 403.
Central Africa	*Cassia* sp		Greshoff II: 67.
	Balanites aegyptiaca Del		Greshoff III: 83.
	Cissus quadrangularis L		Greshoff III: 107.
Sudan	*Mundulea suberosa* (DC.) Benth	Bark, seed	Howes, 1930: 133.
	Adenium honghel A. DC	Root (?)	Howes, 1930: 134.
	Adenium speciosum Fenzl		Do.
Abyssinia	*Millettia ferruginea* Baker		Radlkofer, 1887: 406.
	Verbascum phlomoides L	Root	Greshoff I: 110.
	Lonchocarpus sp		Greshoff III: 76.
	Solanum marginatum L. f	Stalk	Greshoff III: 142.
Tropical East Africa	*Tephrosia periculosa* Baker		Howes, 1930: 133.
Madagascar [1]	*Mundulea pauciflora* Baker	Juice	Grandidier, 1928: 253; Greshoff III: 70.
	Tephrosia vogelii Hook. f	Leaves	Grandidier, 1928: 253.
	Euphorbia laro Drake	Juice	Grandidier, 1928: 253; Greshoff III: 96.
	Barringtonia asiatica (L.) Kurz	Fruit	Grandidier, 1928: 253.
	Barringtonia racemosa (L.) Bl	do	Do.
	Tephrosia monantha Baker		Chevalier, 1925: 1521.
	Mundulea striata Dubard and Dop		Greshoff III: 70.
Cape Verde Islands	*Frankenia ericifolia* C. Sm	Plant	Howes, 1930: 134; Greshoff II: 23.
	Statice pectinata Ait	do	Howes, 1930: 134.
	Aizoon canariense L	do	Do.
Madeira	*Euphorbia piscatoria* Ait		Do.
	Euphorbia mellifera Ait		Do.
Canary Islands	*Euphorbia piscatoria* Ait		Radlkofer, 1887: 413.
Mauritius, Reunion	*Taeburnaemontana mauritiana* Poir.	Bark	Greshoff II: 106.

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[1] See also Linton, 1933, pp. 58–59.

TABLE 6.—*Distribution of fish-poison plants in Australia*[1]

Area	Plant	Part used	Reference
Australia	*Acacia falcata* Willd	Leaves	Howes, 1930:142.
	Acacia pennninervis Sieber	do	Do.
	Acacia salicina Lindl	do	Do.
	Tephrosia purpurea (L.) Pers		Howes, 1930:144.
	Diospyros hebecarpa A. Cunn	Fruit	Howes, 1930:145; Hamlyn-Harris and Smith, 1916: 17.
	Derris trifoliata Lour		Howes, 1930:145.
	Aegiceras majus Gaertn		Radlkofer, 1887:409.
	Adenanthera abrosperma F. Muell	Bark	Greshoff III:62.
	Pongamia glabra Vent	Stems, roots	Greshoff III:77; Hamlyn-Harris and Smith, 1916: 13.
Queensland	*Eucalyptus microtheca* F. Muell	Leaves	Howes, 1930:143; Hamlyn-Harris and Smith, 1916: 15.
	Barringtonia calyptrata R. Br	Bark	Howes, 1930:143.
	Barringtonia asiatica (L.) Kurz	Bark, fruit	Howes, 1930:143; Hamlyn-Harris and Smith, 1916: 15–16.
	Stephania hernandiaefolia Walp	Plant	Shirley, 1896.
	Garcinia cherryi Baill	do	Walter E. Roth, 1901:19.
	Thespesia populnea Corr	Fruit	Hamlyn-Harris and Smith, 1916:9.
	Canarium australasicum	Wood	Do.
	Cupania pseudorhus A. Rich	Bark	Do.
	Derris uliginosa Benth	Stalk	Hamlyn-Harris and Smith, 1916:10.
	Tephrosia rosea F. Muell	Plant	Hamlyn-Harris and Smith, 1916:12.
	Albizzia procera Benth	Bark	Hamlyn-Harris and Smith, 1916:14.
	Acacia spp	Bark, leaves	Do.
	Terminalia seriocarpa F. Muell	Bark	Hamlyn-Harris and Smith, 1916:15.
	Sarcocephalus cordatus Miq	do	Hamlyn-Harris and Smith, 1916:17.
	Asclepias curassavica L	Plant	Hamlyn-Harris and Smith, 1916:19.
	Polygonum hydropiper L	do	Hamlyn-Harris and Smith, 1916:19–20.
	Petalostigma quadriloculare F. Muell.	Fruit	Do.
	Alocasia macrorrhiza Schott	Plant	Hamlyn-Harris and Smith, 1916:20.
	Planchonia careya (F. Muell.) R. Knuth.	Bark, root	Howes, 1930:143; Hamlyn-Harris and Smith, 1916: 16.
	Jagera pseudorhus (A. Rich.) Radlk.	Bark	Howes, 1930:143.
	Tephrosia astragaloides R. Br	Leaves	Walter E. Roth, 1897:95–96.
	Tephrosia rosea F. Muell		Howes, 1930:144.
	Faradaya splendida F. Muell	Bark	Greshoff III:136; Hamlyn-Harris and Smith, 1916: 18–19.
Dunk Island	*Derris koolgibberah* Baill	Stalk	Howes, 1930:145; Hamlyn-Harris and Smith, 1916: 11.
New South Wales	*Acacia* sp		Greshoff II:69–70.

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[1] For full data, see Maiden, 1894; Hamlyn-Harris and Smith, 1916; Howes, 1930, pp. 142–146.

TABLE 7.—*Distribution of fish-poison plants in California*

Tribe	Plant	Part used	Reference
Wailaki	*Chlorogalum pomeridianum* (Ker) Kunth.	Root	Powers, 1877:117.
Kato	*Angelica* sp	Plant	Loeb, 1932:46.
	Chlorogalum pomeridianum (Ker) Kunth.	Root	Do.
Yuki	*Echinocystis oregana* (Cogn.)		Chesnut, 1902:390–91.
	Aesculus californica (Spach) Nutt.	Shoots, leaves	Chesnut, 1902:367.
Wintu	*Chlorogalum pomeridianum* (Ker) Kunth.	Plant	Du Bois, 1935:17.
	Echinocystis fabacea Naud	Root	R. K. Beardsley, MS.
	Eremocarpus setigerus (Hook.) Benth.	Plant	R. K. Beardsley, Field Report (MS.).

TABLE 7.—*Distribution of fish-poison plants in California*—Continued

Tribe	Plant	Part used	Reference
Yahi	"Squirting cucumber"	Fruit	Pope, 1918:130.
Nomlaki, Maidu	*Trichostema lanceolatum* Benth	Plant	Chesnut, 1902:385.
Maidu	*Eremocarpus setigerus* (Hook.) Benth.	do	Greshoff III:89–90.
	Aesculus californica (Spach) Nutt.	Shoots, leaves	Chesnut, 1902:367.
Tolowa	*Chlorogalum pomeridianum* (Ker) Kunth.	Root	Drucker, 1937:294.
Pomo	*Echinocystis fabacea* Naud	do	Loeb, 1926:169.
	Chlorogalum pomeridianum (Ker) Kunth.	do	Kniffen, 1939:376; Chesnut, 1902:320.
	Eremocarpus setigerus (Hook.) Benth.	Plant	Chesnut, 1902:363, 321.
	Datisca glomerata (Presl) Benth. and Hook.		Chesnut, 1902:370.
Central Miwok	*Aesculus californica* (Spach) Nutt.	Nuts	Barrett and Gifford, 1933:190.
	Chlorogalum pomeridianum (Ker) Kunth.	Root	Do.
Southern Miwok	*Aesculus californica* (Spach) Nutt.	Nuts	R. K. Beardsley, Field Report (MS.).
	Echinocystis horrida Congdon	Seeds, root	R. K. Beardsley, MS.
Wappo	*Chlorogalum pomeridianum* (Ker) Kunth.	Root	Driver, 1936:185.
	Eremocarpus setigerus Benth	Plant	Do.
Nisenan	*Chlorogalum pomeridianum* (Ker) Kunth.	Root	Beals, 1933:347; Powers, 1873:375–376, 423.
	Eremocarpus setigerus (Hook.) Benth.	Plant	Beals, 1933:347.
	Aesculus californica (Spach) Nutt.	Nuts	Powers, 1873:375–376, 423.
Salinan			J. Alden Mason, 1912:124.
Owens V. Paiute	*Smilacina sessilifolia* Nutt	Root	Steward, 1933:251.
Yokuts	*Chlorogalum pomeridianum* Kunth	do	R. K. Beardsley, Field Report (MS.).
	Aesculus californica (Spach) Nutt.	Nuts	Kroeber, 1925:529.
	Chlorogalum pomeridianum Kunth	Root	R. K. Beardsley, Field Report (MS.).
	Polygonum lapathifolium L	Plant	R. K. Beardsley, MS.
	Eremocarpus setigerus (Hook.) Benth.	do	Do.
	Trichostema lanceolatum Benth	do	Do.
Northfork Mono	*Eremocarpus setigerus* (Hook.) Benth.	do	Do.
	Umbellularia californica Nutt	Leaves	Do.
	Aesculus californica (Spach) Nutt.	do	Do.

TABLE 8.—*Distribution of fish-poison plants in the Antilles*

Area	Plant	Part used	Reference
Antilles	*Paullinia cururu* L		Radlkofer, 1887:403.
	Paullinia pinnata L		Do.
	Paullinia jamaicensis Macf		Radlkofer, 1887:404.
	Tephrosia toxicaria (Sw.) Pers		Radlkofer, 1887:405.
	Tephrosia cinerea (L.) Pers		Do.
	Lonchocarpus latifolius (Willd.) H. B. K.	Fruit	Radlkofer, 1887:406–407.
	Phaseolus lathyroides L	Juice	Radlkofer, 1887:406.
	Jacquinia barbasco (Loefl.) Mez	Leaves, fruit	Radlkofer, 1887:410.
	Euphorbia cotinifolia L		Radlkofer, 1887:413.
	Serjania polyphylla (L.) Radlk		Do.
Bahamas	*Icthyomethia piscipula* (L.) Hitchc.	Bark, leaves	Goggin, 1939:25.
Cuba	*Agave americana* L		Greshoff II:149.
Porto Rico	*Canella winterana* (L.) Gaertn		Greshoff II:20.
Dominica	*Phyllanthus brasiliensis* (Aubl.) Muell. Arg.	Leaves	Taylor, 1938:145.
	Diospyros sp	Fruit	Taylor, 1938:145; Greshoff III:129.
	Ichthyomethia piscipula (L.) Hitchc.	do	Taylor, 1938:145; Radlkofer 1887:407–408.
Jamaica [1]	*Sapindus saponaria* L	Seeds, root	Greshoff I:42.
	Euphorbia punicea Sw	Leaves, fruit	Radlkofer, 1887:413.
	Tecoma leucoxylon (L.) Mart		Radlkofer, 1887:412.
Martinique	*Clitoria arborescens* Ait.?	Bark, leaves	Radlkofer, 1887:406.
	Basanacantha armata Hook. f.	Fruit	Greshoff II:88–89.
	Clibadium barbasco DC		Greshoff II:89.

[1] For further data, see Blake, 1919.

TABLE 9.—*Distribution of fish-poison plants in Guatemala, Mexico, and the southeastern United States*

Area or tribe	Plant	Part used	Reference
Guatemala [1]	*Enterolobium cyclocarpum* Gris		Wisdom, 1940:77–78.
	Zamia furfuracea L. f		Do.
	Paullinia sp	Stalk	Do.
	Polygonum acre H.B.K		Fagundes, 1935:73.
Honduras (North coast).	A wild vine	Stalk	Bancroft, 1886:720–721.
Mexico	*Gouania* sp		Greshoff I:32; Radlkofer, 1887:398, 402.
	Paullinia costata Schlecht. and Cham.		Radlkofer, 1887:398, 404; Greshoff I:40.
	Buddleia verticillata H.B.K	Plant	Greshoff II:110–111.
	Thevetia neriifolia Juss		Fagundes, 1935:74.
	Ipomoea tuberosa L	Roots	Greshoff II:113.
	Schoenocaulon officinale A. Gray		Greshoff II:152–153.
	Hura crepitans L	Sap	Rose, 1899:257.
	Hura polyandra Baill	do	Howes, 1930:138.
Chiapas, Mexico	*Jacquinea seleriana* Urb and Loesn	do	Do.
Tehuantepec	*Sapindus saponaria* L	Plant	Barnard, 1852:212.
Populuca (Veracruz)		do	G. Foster (information).
San Martin Pajpan		do	Do.
Chiltepec, Mexico		Vine stalk	Weitlaner, 1940:170.
		Root	Weitlaner, 1940:172.
Otomi, Aztec			Do.
Aztecs	*Merremia tuberosa* (L.) Rendle	Root	Greshoff II:113.
Totonac			Weitlaner, 1940:172.
Tarahumare	*Tephrosia talpa* Wats	Plant	Bennett and Zingg, 1935:140.
	Casimiroa edulis Llav. and Lex	do	Bennett and Zingg, 1935:170.
	Casimiroa sapota Oerst	do	Do.
	Calcalia decomposita A. Gray	do	Do.
	Cracca talpa Wats	do	Do.
	Sebastiania bilocularis S. Wats	Sap	Clavigero, 1937:55.
	Polygonum sp		Lumholtz, 1903:vol. 1, p. 401.
	Agave sp	Plant	Do.
Acaxee			Beals, 1932:167.
Yaqui	*Jacquinia pungens* A. Gray	Bark	Drucker, 1941:225; Weitlaner, 1940:171.
Opata	*Sebastiana* sp (?)	Sap	Drucker, 1941:225; Obregón, 1928:172.
Pima Bajo			Drucker, 1941:225.
Baja California	*Sebastiana pavoniana* Muell. Arg	Sap	Greshoff II:144; Ten Kate, 1885:86.
	Lophocereus schotti (Engelm) Br. and Rose.	Plant	H. Aschmann (information).
	Machaerocereus gummosus Britt. and Rose.	do	Greshoff III:114; Brandegee, 1890:107.
Cocopa	*Salix* sp	Leaves	Gifforo, 1933:268.
Southeastern United States.	*Aesculus* sp	Nuts	Adair, 1930:432.
Choctaw	*Aesculus* sp	do	Swanton, 1931:55.
	Ilex verticillata (L.) Gray (?)	Plant	Do.
	Tephrosia sp	do	Do.
Cherokee	*Juglans* sp	Bark	Mooney, 1900:422.
Catawba	*Juglans nigra* L	Nuts	Speck, 1934:73–74.
Yuchi	*Tephrosia virginiana* (L.) Pers	Roots	Speck, 1909:23.
Creek	*Aesculus* sp	Nuts	Speck, 1909:24.
Delaware (Okla.)	*Juglans* sp	Green nuts	Harrington, 1913:222.
	Aesculus glabra Willd	Nuts	Tantaquidgeon, 1942:25.
Florida	*Cornus amomum* Mill	Bark	Glennan, 1886:10–11.
	Piscidia communis	Roots	Killip, 1937:56.

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[1] Wisdom (1940, pp. 77-78) mentions other piscicidal plants (bejuco de pescado, camote sylvestre, matapescado, zopilote, siete pellejus) but without botanical identification.

TABLE 10.—*Distribution of fish-poison plants in South America*[1]

Area	Plant	Part used	Folk name	Reference
Brazil	*Paullinia thalictrifolia* Juss.			Radlkofer, 1887: 404.
	Magonia pubescens St. Hil.	Leaves, bark.	Tingui; tingui capeta.	Radlkofer, 1887: 404; Fagundes, 1935:72.
	Magonia glabrata St. Hil.	Bark, roots	Tingui; Timbó assú.	Radlkofer, 1887: 405; Fagundes, 1935:72.
	Centrosema plumieri (Turp.) Benth.	Bark	Guaiana-timbó?	Radlkofer, 1887: 406.
	Clitoria amazonum Mart.?	Branches	Timbó de cono?	Do.
	Camptosema (?) *pinnatum* Benth.		Gorano-timbó	Do.
	Camptosema sp.		Timbó	Do.
	Lonchocarpus rariflorus Mart.?		Taraira-moirá?	Radlkofer, 1887: 407.
	Bowdichia virgilioides Kunth		Sebipira	Radlkofer, 1887: 408.
	Bauhinia guianensis Aubl.			Do.
	Leguminosae sp.		Piracu-úba	Do.
	Gustavia brasiliana DC	Fruit	Janiparandiba; japarandiba; japarandi; geniparana.	Radlkofer, 1887: 409; Fagundes, 1935:71.
	Ichthyothere cunabi Mart.	Plant	Cunabi; cunambi; conamy.	Do.
	Thevetia peruviana (Pers.) Schum.	Leaves, fruit.	Ahoui-guacu; jorro-jorro.	Radlkofer, 1887: 409; Fagundes, 1935:74.
	Cocculus imene Mart.		Taraira-moirá	Radlkofer, 1887: 401.
	Annona reticulata L.			Fagundes, 1935:70.
	Lonchocarpus floribundus Benth.	Plant	Timbó venenoso	Fagundes, 1935:71; Filho, 1935:19.
	Odontadenia cururu K. Sch.	do	Cipó cururu	Fagundes, 1935:72.
	Pachyrrhizus angulatus Rich.		Jacatupe	Do
	Paullinia alata (Ruiz and Pav.) Don.		Urariana	Do
	Phyllanthus piscatorum H. B. K.		Tingir de Perou	Vellard, 1941; 83.
	Annona spinescens Mart.		Anaticum do Brejo.	Fagundes, 1935:70.
	Dipladenia illustris Muell.			Fagundes, 1935:71.
	Indigofera lespedezioides H. B. K.		Timbó mirim	Fagundes, 1935:71; Vellard, 1941:83.
	Paullinia meliaefolia Juss.		Timbó peba; tingui de Folha Grande.	Fagundes, 1935:72.
	Paullinia rubiginosa Camb.		Cruapé-vermelho	Do.
	Paullinia trigonia Vell.		Tingui; timbó aitica.	Do.
	Phyllanthus cladotrichus Muell. Arg.		Nerva de pombinha da serra.	Do.
	Phyllanthus Sw.		Conami; timbó conabi.	Fagundes, 1935:72; Vellard, 1941:83.
	Phyllanthus piscatorum H. B. K.		Tingui de peixe	Fagundes, 1935:72.
	Polygonum acre H. B. K.		Herba de bicho; cataya.	Vellard, 1941:82.
	Clibadium barbasco DC			Fagundes, 1935:71.
	Derris pterocarpa (DC.) Killip		Timbó; timbó dematta; timbórana; timbó cipó timbó-assú.	Fagundes, 1935:71; Filho, 1935:19.
	Clibadium surinamense L.		Conami	Fagundes, 1935:71.
	Piscidia erythrina L. (?)		Timbó; timbó boticario.	Fagundes, 1935:73; Vellard, 1941:82.
	Sapindus saponaria L.		Quiti; maca-acaipú; casita; jequitir-guassú.	Fagundes, 1935:73.
	Serjania communis Camb.		Timbó méndo	Do.
	Serjania cuspidata Camb.		Timbó capelludo; timbó de peixe.	Do.
	Serjania dentata (Vell.) Radlk.		Timbó de restingas.	Do.
	Serjania glabrata H. B. K.		Tamuja	Do.
	Serjania paucidentata DC			Do.
	Serjania purpurascens Radlk.		Timbó vermelho	Do.
	Talisia esculenta (St. Hil.) Radlk.		Pitombeira	Fagundes, 1935:74.
	Tephrosia nitens Benth.		Timbó cáa; ajaré	Fagundes, 1935:74; Filho, 1935:19.

See footnotes at end of table.

TABLE 10.—*Distribution of fish-poison plants in South America*—Continued

Area	Plant	Part used	Folk name	Reference
Brazil	*Thevetia ahouai* (L.) A. DC		Agai	Fagundes, 1935:74.
	Tripterodendron filicifolium (Linden) Redlk.		Farinha secca	Do.
	Enterolobium timbouva Mart		Orelha de preto; Timborá; timbóura.	Filho, 1935:19.
	Cleome spinosa Jacq. (?)		Tareralya	Radlkofer, 1887: 402.
	Serjania lethalis St. Hil		Cipo de timbó; matta fomó; pehko.	Radlkofer, 1887: 408.
	Serjania erecta Radlk	Stem, leaves	Timbó bravo; cipo de timbó; turari.	Do.
	Serjania ichthyoctona Radlk		Timbó; timbó de peixe; tingui legitimo.	Radlkofer, 1887: 403; Fagundes, 1935: 73.
	Serjania acuminata Radlk		Timbó de peixe	Do.
	Serjania piscatoria Radlk		Tingi; tingui de peixe.	Do.
	Paullinia cupana H. B. K		Guaraná	Radlkofer, 1887: 404.
	Thevetia ahouai (L.) A. DC	Leaves, fruit	Ahoui-mirim	Radlkofer, 1887: 410.
	Buddleia brasiliensis Jacq		Barbasco	Radlkofer, 1887: 411; Fagundes, 1935: 70.
	Euphorbia cotinoides Miq		Gunapalu; assucu-i; leiteira.	Radlkofer, 1887: 413; Vellard, 1941: 83.
	Phyllanthus conami Sw	Fruit, leaves	Conami	Radlkofer, 1887: 414.
	Piranhea trifoliata Baill	Stems	Piranha-úba; pirand-úba; pyranheira.	Radlkofer, 1887: 414: Vellard, 1941: 83.
	Ruprechtia laurifolia C. A. Mey	Leaves	Timpa-pêba; timbubeba.	Greshoff III: 36.
	Paullinia australis St. Hil		Timbó; timbó de Rio Grande.	Greshoff III:102; Fagundes, 1935: 72.
	Paullinia pinnata L		Timbó; matta porco; Cururuapé; timbó cipó; cruape vermelho.	H. W. Bates, 1892: 220–21; Fagundes, 1935: 72; Filho, 1935: 19.
	Paullinia trigonia Vell	Bark	Tingui sipo	Greshoff II: 37.
	Joannesia princeps Vell	Bark, juice	Anda, anda-assu	Radlkofer, 1887: 414; Fagundes, 1935: 71.
	Manihot esculenta Crantz	Juice, root		Radlkofer, 1887: 414.
	Hura crepitans L	Juice	Arceira; oassucu; assacú; assaca.	Radlkofer, 1887: 415; Fagundes, 1935: 71.
	Lonchocarpus nicou (Aubl.) DC	Leaves, roots.	Timbó legitimo	Killip and Smith, 1931: 407.
	Lonchocarpus urucu K. and S	Leaves, etc	Timbóurucú; timbó macaquinho; timbó rouge; timbó carajurú.	Killip and Smith, 1931: 407; Filho, 1935: 18.
	Tephrosia toxicaria (Sw.) Pers	Leaves, etc	Timbó de Cayenne; onabouboue; anil bravo.	Killip and Smith, 1931: 407.
	Tephrosia emarginata HBK			Killip and Smith, 1931: 407; Fagundes, 1935: 74.
	Clibadium sylvestre (Aubl.) Baill			Killip and Smith, 1931: 407.
	Enterolobium timboúva Mart		Timbouva	Greshoff III: 61.
	Derris negrensis Benth		Timborana; timbó guassis.	Greshoff III: 74; Vellard, 1941: 82.
	Serjania noxia Camb		Timbó de leite	Greshoff III: 105.
	Cestrum laevigatum Schlecht			Greshoff III: 139.
Guiana[2]	*Manihot esculenta* Crantz	Root		Gillin, 1936: 13–14.
	Jacaranda procera Spreng			Radlkofer, 1887: 412.
	Euphorbia cotinoides Miq		Gunapalu	Radlkofer, 1887: 413.
	Phyllanthus conami Sw	Fruit, leaves	Conami	Radlkofer, 1887: 414.

See footnotes at end of table.

TABLE 10.—*Distribution of fish-poison plants in South America*—Continued

Area	Plant	Part used	Folk name	Reference
Guiana	*Tephrosia cinerea* (L.) Pers		Sinapou	Radlkofer, 1887: 405.
	Lonchocarpus densiflorus Benth	Roots	Hairi; bastard hairri.	Walter E. Roth, 1924; 203; Gillin, 1936 11–14; Radlkofer, 1887: 407.
	Lonchocarpus rariflorus Mart		Fai faia noroko	Archer, 1934: 205.
	Lonchocarpus rufescens Benth	Roots	Hairi	Walter E. Roth, 1924: 203; Gillin, 1936: 13.
	Clibadium asperum DC	Leaves, fruit	Conami	Quelch, 1894: 238; Walter E. Roth, 1924: 203–204.
	Clibadium surinamense L	do		Radlkofer, 1887: 409. Walter E. Roth, 1924; 203–204.
	Tephrosia toxicaria (Sw.) Pers		Counami; yarro conalli.	Walter E. Roth, 1924: 204.
		Tree chips	Wa'u; mora balli	Gillin, 1936: 13.
	Caryocar glabrum Pers			Radlkofer, 1887: 402.
	Tapura guianensis Aubl		Bois de Golette	Radlkofer, 1887: 403.
	Lonchocarpus nicou (Aubl.) DC	Branches	Nicou; Inekou; "real hiaree"; heirri; haiari.	Radlkofer, 1887: 407; Greshoff III: 75–76.
	Muellera frutescens (Aubl.) Standl.		Haiariballi	Greshoff III: 76; II: 64.
	Derris guianensis Benth			Radlkofer, 1887: 407.
	Cassia venenifera Rodschied	Roots	Piami	Radlkofer, 1887: 408.
	Bauhinia guianensis Aubl		Hikuritarifon	Radlkofer, 1887: 408; Archer, 1934: 205.
	Gustavia augusta L			Radlkofer, 1887: 409.
	Clibadium surinamense L			Do.
	Serjania paucidentata DC		Abaho-	Archer, 1934: 205.
	Serjania pyramidata Radlk		Casire	Do.
	Serjania spp		Hebechiabo; kotupurru.	Do.
	Talisia squarrosa Radlk		White moruballi	Do.
	Alexa imperatricis (Schomb.) Baker.		Hairiballi	Do.
	Antonia ovata (Hook). Prog		Inyáku	Do.
	Jacquinia sp		Teterumballi	Do.
	Clathropis brachypetala (Tul.) Kleinh.		Arumatta	Do.
	Piper spp		Warakabakoro; tona.	Do.
	Pothomorpha peltata (L) Miq.		Duburibanato	Do.
	Phyllanthus conami Sw		Bois á enivrer tue poisson.	Vellard, 1941: 83.
Eastern Peru	*Tephrosia toxicaria* (Sw.) Pers	Leaves	Cube	Killip and Smith, 1931: 403; Goodspeed, 1941: 152; Tessmann, 1930: El. 22.
	Lupinus mutabilis Sweet	Plant		Killip and Smith, 1931: 403.
	Lonchocarpus nicou (Aubl.) DC	Leaves	Cube; barbasco	Killip and Smith, 1931: 404.
	Serjania glabrata Kunth	Stalk	Verap	Do.
	Serjania rubicaulis Benth	do	do	Do.
	Serjania rufa Radlk	do	do	Do.
	Clibadium strigillosum Blake		Guaco	Do.
	Clibadium vargasii DC	Plant		Tessmann, 1930: El. 22.
Peru	*Lobelia tupa* L			Radlkofer, 1887: 409.
	Tephrosia toxicaria (Sw.) Pers		Barbasco	Herrera, 1940: 81.
	Apurimacia incarum Harms		Chancanhuai	Herrera, 1940: 86.
	Lonchocarpus nicou (Aubl.) DC		Kumu; koubé; conapi; pacai; barbasco.	Herrera, 1940: 98; Fagundes, 1935: 71–72; Vellard, 1941: 82.
	Sapindus saponaria L		Sullucu	Herrera, 1940: 118.
	Cinchona sp	Bark		Greshoff II: 88.

See footnotes at end of table.

TABLE 10.—*Distribution of fish-poison plants in South America*—Continued

Area	Plant	Part used	Folk name	Reference
Ecuador			Tôte; barbasco	Von Hagen, 1939: 38–39.
Bolivia	*Serjania lethalis* Sr. Hil	Stalk	Pehko; sacha	Greshoff I: 36.
Chile	*Lobelia tupa* L			Radlkofer, 1887: 409.
Venezuela	*Euphorbia caracasana* Boiss			Radlkofer, 1887: 413; Greshoff, I: 132.
	Lonchocarpus rufescens Benth. (?).		Barbasco blanco	Ramirez, 1943: 504.
	Agave americana L			Greshoff, II: 149–50.
	Gustavia augusta L			Radlkofer, 1887: 409.
	Clibadium barbasco DC		Barbasco amarillo; barbasco; juque.	Ramirez, 1943: 504; Radlkofer, 1887: 409.
	Jacquinia arborea Vahl		Barbasco	Radlkofer, 1887: 410.
	Bryrsonima crassifolia H. B. K.	Branches	Chaparro de Manteca.	Greshoff, II: 27–28.
	Cusparia trifoliata (Willd.) Engl.		Cuspa	Greshoff II: 29.
	Polygonum glabrum Willd		Barbasco; chiguirera.	Vellard, 1941: 82; Ramirez, 1943: 504.
	Piscidea guaricensis Pittier		Borracho; jebe, barbasco amarillo; barbasco jaune.	Vellard, 1941: 82; Ramirez, 1943: 504.
	Ichthyothere terminalis (Spreng.) Blake.		Galicosa; jarilla; dictamo real.	Vellard, 1941: 84.
	Tephrosis toxicaria (Sw.) Pers	Root	Barbasco de raiz; kouna.	Vellard, 1941: 82–83; Ramirez, 1943: 504.
	Tephrosia cinerea L		Sen senextranjero; barbasco blanc.	Ramirez, 1943: 504; Vellard, 1941: 83.
	Hura crepitans L		Jabillo; ceibo blanco.	Vellard, 1941: 83.
	Phyllanthus piscatorum H. B. K.		Barbascayo	Ramirez, 1943: 504; Vellard, 1941: 83.
	Jacquinia aristata Jacq		Barbasco; olivo; chilca; chirca.	Ramirez, 1943: 503; Vellard, 1941: 83.
	Jacquinia revoluta Jacq			
	Jacquinia mucronulata Blake			
	Jacquinia armillaris Jacq			
	Indogifera suffruticosa Mill		Añalito; Raiz de la virgen.	Ramirez, 1943: 503.
	Piper riolimonense Trel		Raiz de muela	Ramirez, 1943: 504.
	Thevetia peruviana (Pers.) Schum.		Caruache; cascabel; lechero; cruceta real.	Velland, 1941: 84.
Costa Rica	*Serjania inebrians* Radlk		Barbasco	Radlkofer, 1887: 403.
Panama	*Piper darienense* C. DC	Leaves	do	Radlkofer, 1887: 412.
Cayenne	*Lonchocarpus densiflorus* Benth.	Roots		Roth, Walter E., 1924: 202.
	Lonchocarpus rufescens Benth	do		Roth, Walter E., 1924: 203.
	Lonchocarpus nicou (Aubl.) DC.	do		Roth, Walter E., 1924: 203.
Argentina	*Polygonum acre* H. B. K		Caa tay	Vellard, 1941:82.
Paraguay	*Polygonum acre* H. B. K		Yerba picante	Do.
	Cardiospermum grandiflorum Sw.			Do.
	Thinouia paraguayensis Radlk			Vellard, 1941: 83.
Surinam[3]	*Phyllanthus conami* Sw	Leaves	Barbasco	Greshoff III: 87.
	Tephrosia toxicaria (Sw.) Pers	Plant	Wanamoe; doekali; koenamie.	Greshoff III: 71, 76, 94.
	Lonchocarpus violaceus H. B. K.		Nekoe; Hojali	Greshoff III: 76.
	Euphorbia cotinoides Miq.		Koenapaloe	Greshoff III: 76, 94.
	Lonchocarpus densiflorus Benth.	Roots		Roth, Walter E., 1924: 203.
	Lonchocarpus rufescens Benth.	do		Roth, Walter E, 1924: 203.
	Lonchocarpus nicou (Aubl.) DC.	do	Neka	Roth, Walter E. 1924: 203; Vellard, 1941, 82.

See footnotes at end of table.

TABLE 10.—*Distribution of fish-poison plants in South America*—Continued

Area	Plant	Part used	Folk name	Reference
Surinam	*Serjania inebrians* Radlk.	Vine	Barbasco	Conzemius, 1932: 70.
Colombia	*Tephrosia toxicaria* (Sw.) Pers.	Roots	do	Wassen, 1935: 103–104.
	Derris elliptica (Roxb.) Benth.	do		Santesson, 1935: 25.
Tropical America.	*Sapindus saponaria* L.	Leaves	Sapo indicus; jaboncillo.	Radlkofer, 1887: 404.
	Nissolia fructicosa Jacq.			Greshoff II: 53.
	Polygonum acuminatum H.B.K.			Vellard, 1941: 182.
	Cassia semperflorens DC.			Greshoff III: 64.

[1] See Métraux, 1928; Nordenskiöld, 1920; Killip and Smith, 1930, 1931, 1935; Radlkofer, 1887; Lowie, 1940; Howes, 1930, pp. 134–38; Roark, 1936, pp. 19–27; 1938, pp. 23–24.

[2] See also Archer, 1934; Martyn and Follett-Smith, 1936.

[3] For further data, see Borst Pauwels, 1903 a, 1903 b.

NOTE

Since the present paper was written a dozen years ago much new information on the subject has appeared. Although it is not feasible to cite all the recent additions to fact, a few references have been added to the bibliography in galley and others are cited here.

Rostlund's preliminary paper of 1948 has been followed by a recent monograph (Rostlund, 1952) which deals extensively with fresh-water fish and fishing in aboriginal North America. Rostlund discusses the physical environment of fish poisoning as a culture trait (pp. 127–129), a subject which I have here only mentioned. His distributional data (pp. 129, 130, 188–190, map 39) agree with mine in showing two major and disparate areas of fish drugging, California and the Southeast. Eschewing speculation on the possibility of historical connection between the two areas, Rostlund (pp. 131–133) considers the possibility of historic introduction of fish poisoning in the Southeast through Europeans or African Negroes. The idea is a good one, and I did not see it. In addition to the Southeastern tribes listed here in table 9 as employing piscicides, Rostlund cites the Chickasaw. More northerly tribes cited by him include the Penobscot, Iroquois, Delaware, Nanticoke, Powhatan tribes (?) and Sauk. Rostlund discusses and rejects the hypothetical circum-North Pacific route of introduction of fish poisoning to North America.

R. H. Lowie (1951, pp. 18–20) has discussed some generalities of fish drugging in world perspective and as illustrative of certain cultural processes.

G. Hewes (1942) in a study of northern California fishing has plotted the distribution of fish poisoning, and a useful note by McFarland (1951) further supplements the data on California Indian piscicides.

R. F. H.
May 1952.

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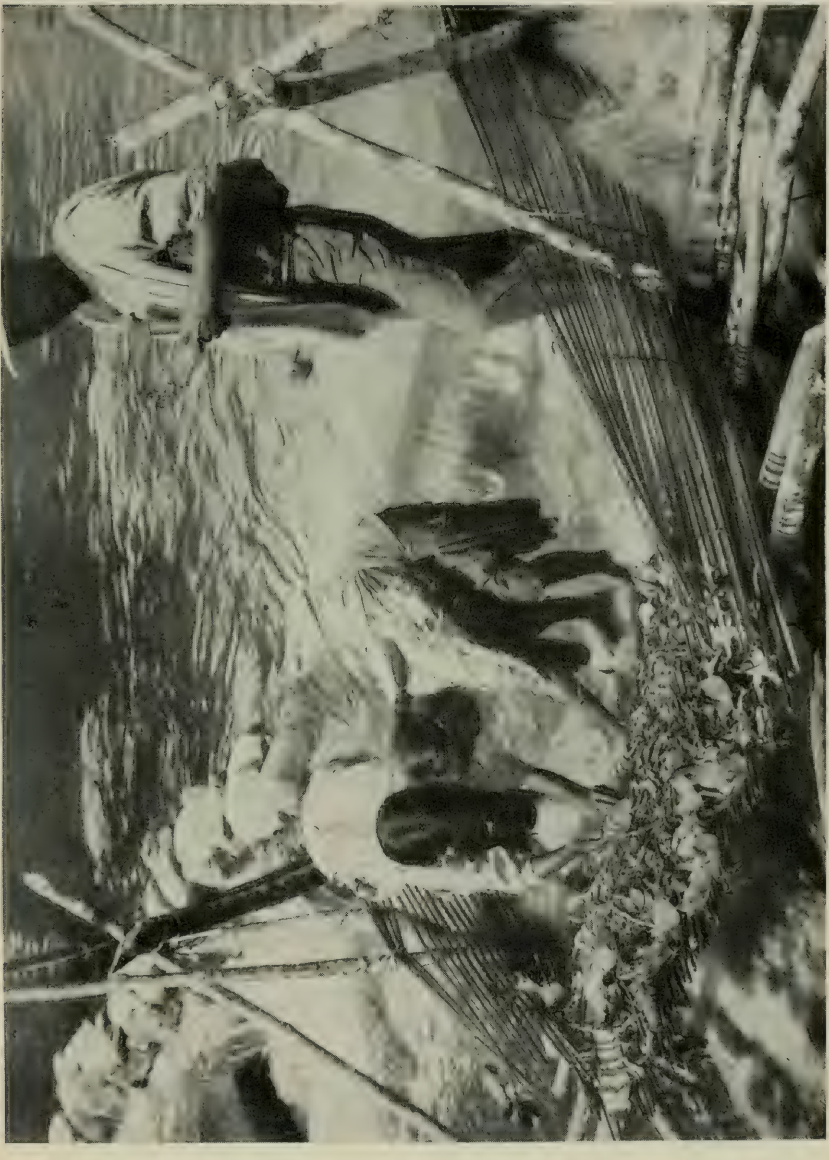
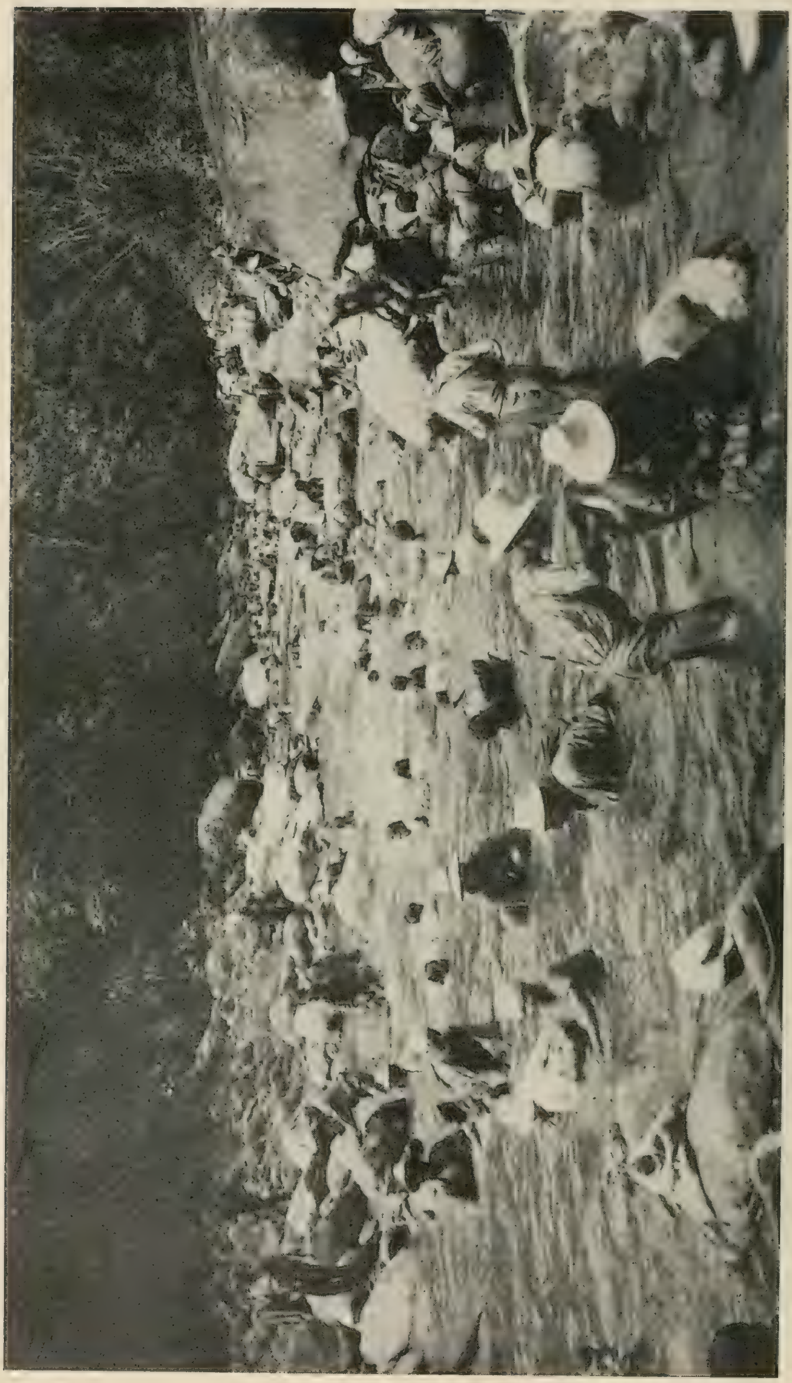


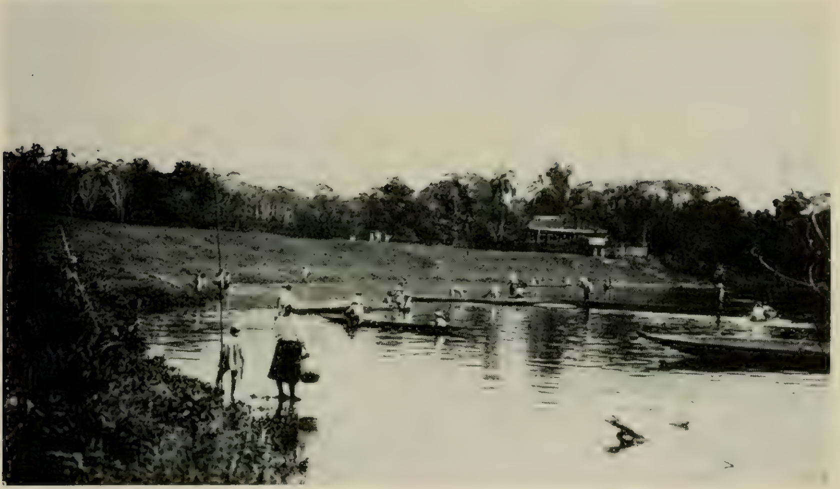
JÍVARO INDIANS POISONING FISH.

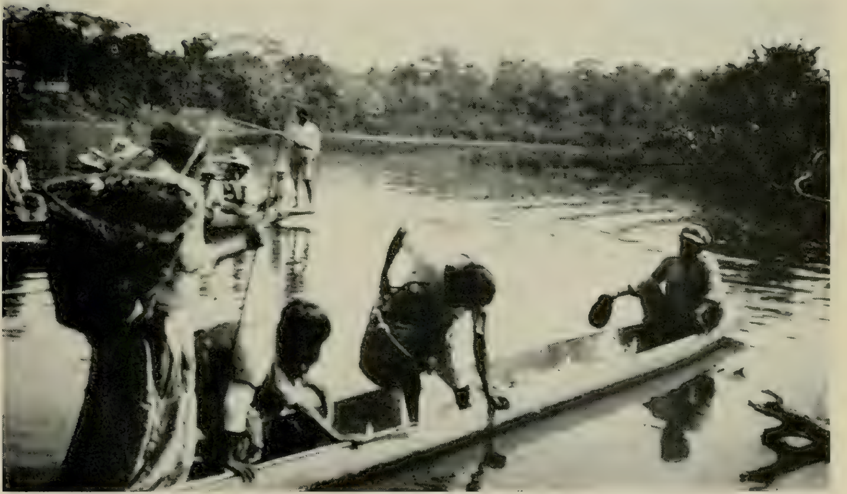
(Photograph by E. P. Killip.)



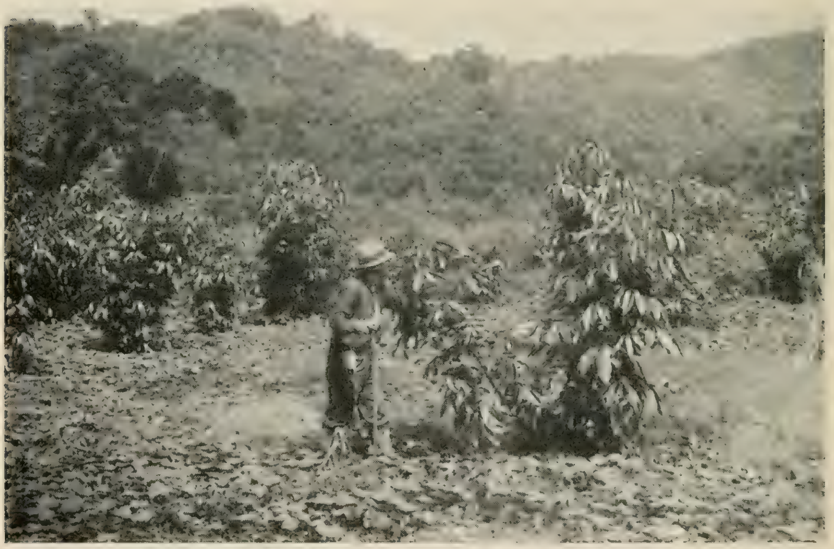
Jívaro Indians Collecting Stupefied Fish.

(Photograph by E. P. Killip.)





SOUTH AMERICAN INDIANS POISONING FISH, FORTALEZA, NEAR YURIMONGAS.



Plantation of Fish-poison Plants, Fortaleza, Near Yurimongas.

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Aboriginal Navigation off the Coasts of Upper and Baja California

By ROBERT F. HEIZER and WILLIAM C. MASSEY

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ABORIGINAL NAVIGATION OFF THE COASTS OF UPPER AND BAJA CALIFORNIA

By Robert F. Heizer and William C. Massey

INTRODUCTION

There is no adequate summary of aboriginal navigation off the west-central coast of North America. Friederici's (1907) general treatment of native navigation in the New World is still the best we have, but for the California region this work does not satisfy the requirements of intensive treatment. Kroeber's summary of aboriginal navigation in Upper California (lat. 33° N. to 42° N.) is good, but is based mainly upon ethnographic information, and for certain critical areas can be amended or added to in detail by the early historical accounts (Kroeber, 1925, pp. 243–244, 812–814, passim).

The Pacific coast, from the Oregon-California boundary [1] to the southern tip of Lower California is a stretch of about 1,600 miles, and embraces some nineteen degrees of latitude. Environmentally this long coastal area may be divided into separate provinces. In the north from the Oregon-California boundary to the mouth of the Russian River is a rainy coast where conifer forests come down to the water's edge, and with turbulent rivers which meet the rocky coast. Here is an ideal habitat for the heavy log dugouts, or for log rafts. From Bodega Bay southward to Point Concepcion is a relatively treeless coast, somewhat rocky, but with several large and numerous small sandy bays. Wood is scarce, and the tule balsa is the sole means of navigation for inshore water travel. The coast dwellers occasionally used balsas to fish in the quiet waters of some bay; never to make long expeditions where walking would be quicker, safer, shorter, and on the whole easier.

Between Point Concepcion and Santa Monica Bay is the sheltered Santa Barbara Channel which harbored the maritime Chumash peoples. Driftwood logs, a well-developed woodworking complex, and sheltered waters seem to have favored the development here of the multiplank boat.

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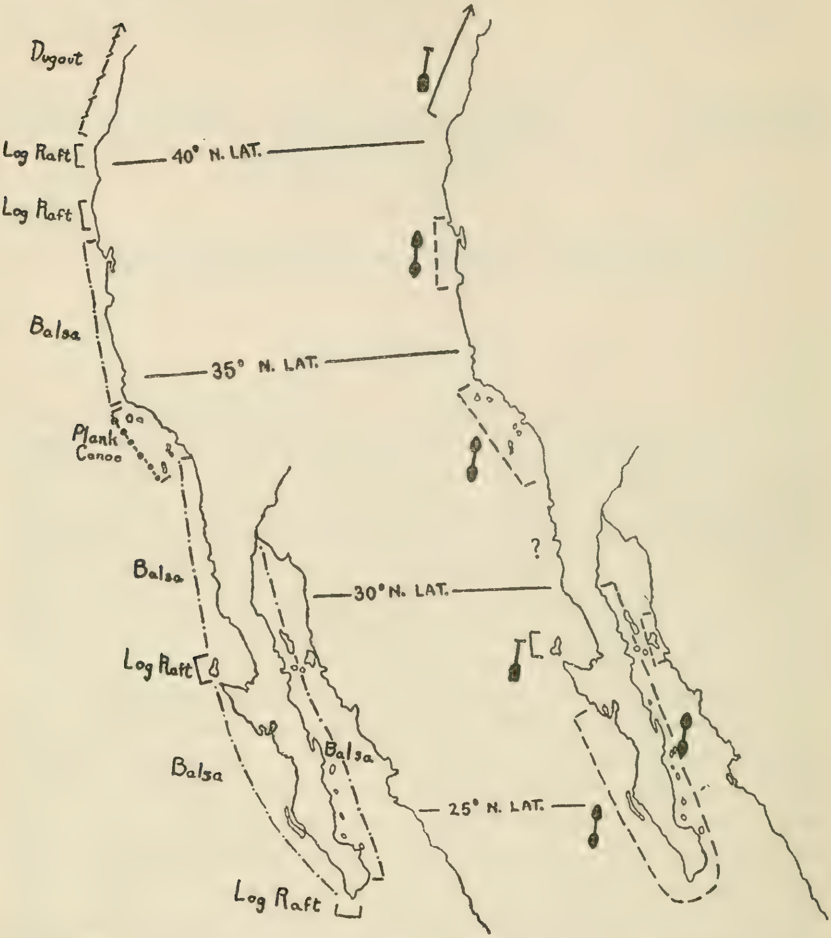
[1] For the coastal area north of the Oregon-California boundary, see the excellent paper on northwestern canoes by Olson (1927).


Dugout
Log Raft
Log Raft
40° N. LAT.
Balsa
35° N. LAT.
Plank Canoe
Balsa
30° N. LAT.
?
Log Raft
Balsa
Balsa
25° N. LAT.
Log Raft

MAP 5.—Distribution of boat and paddle types along the coasts of Upper and Baja California.

From San Diego south along the entire west coast of Baja California is a low-latitude desert littoral where available softwood is absent (with two exceptions to be noted below). Wooden boats would be an impossibility, and the balsa made of easily gathered tules (*Scirpus* sp.) is generally employed. Great stands of cedars at Cedros Island and pines at Cape San Lucas offered variety in materials for boats, and here we find log rafts, but not dugouts.

Inside the Gulf of California along the east shore of the peninsula is again a treeless coast, somewhat broken by small bays, and offshore islands. Here, as on the ocean side, the balsa was used for navigation.

With the partial exceptions of the Chumash of the Santa Barbara

Channel, who were accustomed to fish in deep waters in their seagoing plank canoes, and the Pericue of Cape San Lucas, who went out of sight of land on fishing expeditions, the coastal tribes of Upper and Baja California could hardly be called maritime. Boats, whether dugouts, balsas, or rafts, seem incidental and generally nonessential cultural features of the whole area.

The differences in coastal topography are not very profound, yet sufficiently so that local environments favored the use of particular types of boats. These boat types are few and may be enumerated as follows:

(1) Tule balsas.
(2) Log dugouts.
(3) Log rafts.
(4) Plank canoes.

TULE BALSAS

In the whole coastal area under discussion, the tule balsa has the most extensive distribution of any single type of boat. Interruptions in the distribution are due to either unfavorable environmental conditions or the use of other types of boats. Nonoccurrence cannot be explained by the absence of materials (*Scirpus* sp.).

The northernmost coastal occurrence of the tule balsa is Bodega Bay (lat. 38°30′), where its presence is attested by a number of early explorers (Wagner, 1931, p. 331; Maurelle, 1781, p. 515; Corney, 1896, p. 81; Colnett, 1940, p. 175; Bolton, 1926, IV, p. 48; Khlebnikov, 1940, p. 333). It was propelled by means of a double-bladed paddle. (The balsa and paddle are illustrated here, after Colnett (1940, pl. opp. p. 176) in fig. 11). Bodega Bay also marks the northernmost occurrence of this paddle type (Colnett, 1940, p. 175). Colnett said of the Bodega (Coast Miwok) Indians in 1791:

> Their rush floats are form'd in the following manner, three Bundles making the Bottom, and one on each side, Bow and Stern. Their Paddle is pointed at each end, held by the middle and used alternately, side and side, and End and End.

The tule balsa and double-bladed paddle were noted at Drake's Bay by Cermeño in 1595 (Wagner, 1924, p. 13). The balsa is known much farther north in the interior. The Thompson Indians of British Columbia used this boat as did the Klamath and some north-central California tribes.

The Costanoan Indians living on the shores of San Francisco Bay used only the balsa for navigating. The double-bladed paddle was also in use on the Bay (Menzies, 1924, p. 271; Khlebnikov, 1940, p. 333; Kotzebue, 1830, vol. 2, p. 90; Chamisso *in* Kotzebue, 1821, vol. 3, p. 48; Choris, 1822, pt. 3, p. 6; Bolton, 1927, p. 293; Von

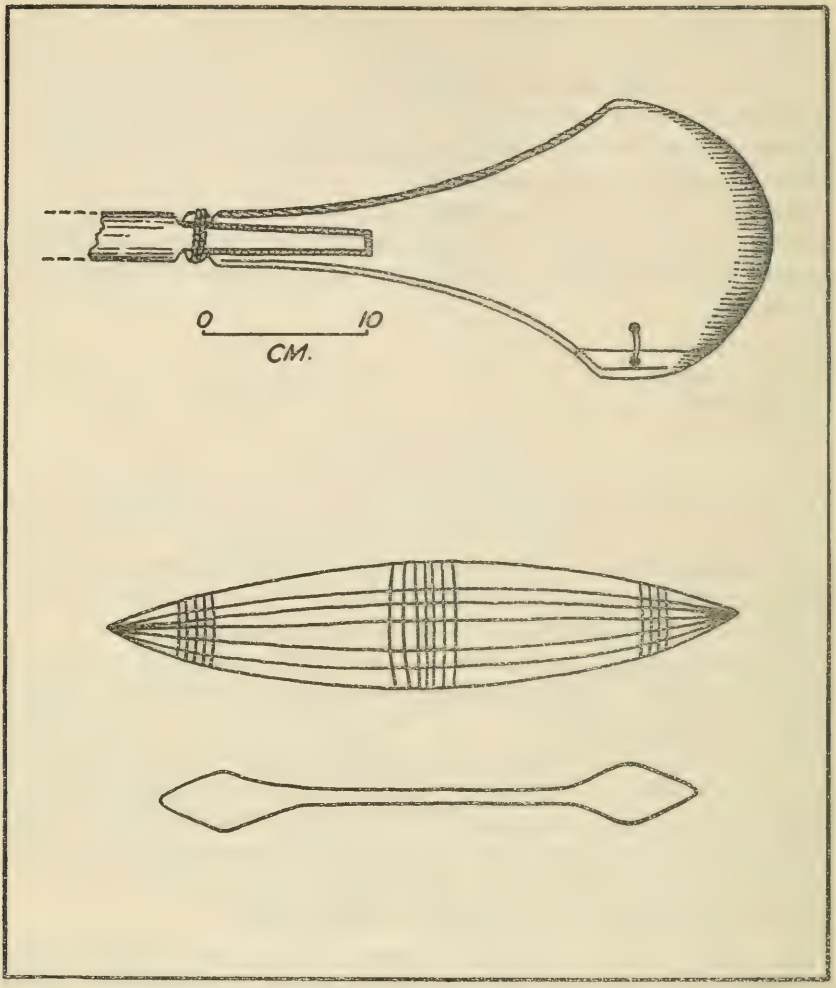


FIGURE 11.—*Upper:* Chumash paddle collected by Vancouver Expedition, 1793. *Lower:* Colnett's sketch of a Coast Miwok balsa and paddle seen at Bodega Bay, 1791.

Langsdorff, 1814, pp. 187–188). Menzies describes the balsa as follows:

> As we were going on shore in the forenoon two of the natives came along side in their *Canoe* if a few bundles of bulrushes fastend together could be called by that name, for it was about fourteen feet long and consisted of three or four bunches of bulrushes fastend together with thongs and tapering at both extremities; on this the two Men sat, each having a long paddle with a blade at each end which was held by the middle and used on both sides alternately . . . [Menzies, 1924, p. 271.]

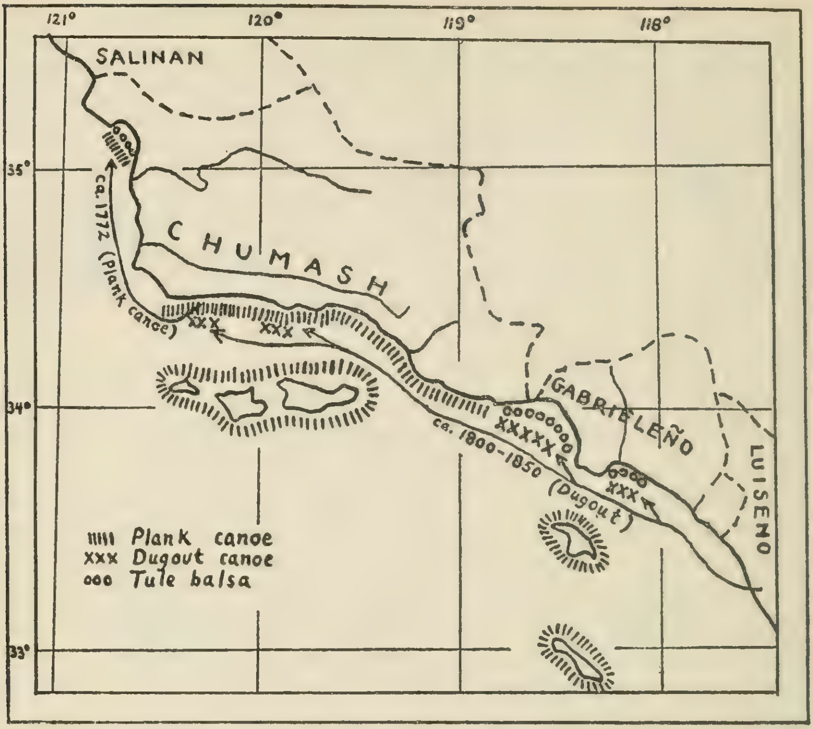
Vancouver notes the balsa at San Francisco as follows:

> A message . . . was brought by three of the native Indians who spoke Spanish, and who came on board in a canoe of the country; which with another (though perhaps the same) seen crossing the harbour the evening we entered it, were the only Indian vessels we had met with, and were without exception the most rude and sorry contrivances for embarkation I had ever beheld. The length of them was about ten feet, the breadth about three or four; they were constructed of rushes and dried grass of a long, broad leaf, made up into rolls the length of the canoe, the thickest in the middle, and regularly tapering to a point at each end . . . They crossed the inlet for the purpose of catching fish . . . They conducted their canoe or vessel by long double-bladed paddles, like those used by the Esquimaux. [Vancouver, 1798, vol. 2, p. 90.]

Southward of San Francisco the balsa made of three or more bundles of tule lashed together was employed sporadically by Costanoans (Fages, 1937, p. 69; de Laperouse, 1798, vol. 2, p. 228; Vancouver, 1798, vol. 2, p. 5). This boat was used by the Indians of Monterey Bay for fishing. Here, as farther north, the double-bladed paddle was used for propulsion (Kroeber, 1925, p. 468; Costanso, 1910, p. 155; Vancouver, 1798, vol. 2, p. 5; von Langsdorff, 1814, vol. 2, pp. 187–188). South of Monterey to Point Concepcion the balsa was used in bays and protected coastal waters. In 1595 Cermeño mentioned use of balsas in San Luis Obispo (Wagner, 1924, p. 16). Shortly after the founding of Mission San Luis Obispo in 1772, the Santa Barbara Channel plank boat was imported for use by the Mission Indians at San Luis Obispo (Heizer, 1941; Wagner, 1924, pp. 6–7). Vizcaino in 1602 mentioned seeing balsas on the coast occupied by the Salinan Indians (Wagner, 1929, pp. 240, 242).

Although the balsa was probably known and perhaps occasionally used by the Chumash of the Santa Barbara region, it can hardly be considered the typical boat of this area. The balsa was not seen or noted by the Spanish explorers on the Santa Barbara Channel in the eighteenth century. Harrington (1942, section on "Navigation") implies that the balsa is an aboriginal Barbareño Chumash feature, but on what grounds is not stated by him or known to us. A detailed account of a well-made, bitumen-covered balsa from the Santa Barbara Chumash was printed in 1894, and though the author is unknown it was probably Lorenzo Yates (Anonymous, 1894). The account reads as follows:

> Tules were firmly and closely tied with fiber taken from different plants and tarred with asphaltum into bundles about four inches in diameter in the center and tapering to a point at both ends, and of the length of the intended boat.
>
> Pliant sticks, which were intended to act as the ribs of the boat, were shoved through the bundles at intervals in the manner indicated in Figs. 1 and 2 [pl. 21 of this publication.] After a sufficient number of bundles of tules and pliant sticks were placed together, they were bent and secured in the form of the main body of the boat. The bow and stern of the boat were then made in the form and


121°
120°
119°
118°
35°
34°
33°
SALINAN
CHUMASH
GABRIELEÑO
LUISEÑO
ca. 1772 (Plank canoe)
ca. 1800-1850 (Dugout)
IIIII Plank canoe
xxx Dugout canoe
ooo Tule balsa

MAP 6.—Distribution of boat types in the Santa Barbara Channel and adjoining regions.

manner shown in Figs. 1 and 3. The tules were then quilted with tarred fiber until they were firm and watertight, BBB in Figs. 1 and 3. The bent position of the ribs was maintained by seats. Further rigidity was given to the boat, if necessary, by fastening poles lengthways of the boat to the ribs. The outside of the boat was then smeared with liquid asphalt of the consistency of heavy tar, AA, Fig. 3.

This account can hardly be purely imaginative, yet there is nothing similar known concerning tarred balsas. The general method of manufacture is Californian, however, and it may be that this particular form of boat is a late historic development which combined certain features of the old plank-boat complex grafted on the balsa boat.

The Gabrieleño to the south also knew the balsa (Fages, 1937, p. 23), but they shared the plank boat with the Chumash. The Luiseño next to the south, used both the balsa and the dugout canoe (Kroeber, 1925, p. 654). The paddle type is not known, although the double-bladed form, in view of its occurrence to the north and south, was almost certainly used. The coastal Diegueño knew only the tule balsa and double-bladed paddle (Menzies, 1924, p. 340; Costanso, 1910, p. 123).

Cabrillo's reference to "small canoes" near Punta Banda in latitude 31°50′ (Cabrillo *in* Bolton, 1916, p. 21; Cabrillo *in* Wagner, 1929, p. 84) probably indicates the presence there of tule balsas, which may be ascribable to the coastal Diegueño of the peninsula (Vizcaino *in* Bolton, 1916, p. 73). Taylor (1860) reports that in 1856 a native at San Miguel Mission described balsas of reed formerly used for fishing in northwestern Baja California. At San Quentin Bay, Vizcaino saw tule balsas, and immediately to the north, at San Martin Island, Cermeño encountered Indians in boats, probably tule balsas (Cermeño *in* Wagner, 1929, p. 16). Vancouver, when off Rosario Bay just south of San Quentin saw "a native in a straw canoe like those seen at San Francisco" (Vancouver, 1798, vol. 2, p. 482).

Sales' account contains a careful description of the balsa referring to the Dominican mission region north of Rosario:

> The Indians make some very small canoes; among some tribes they are of wood, in others they are of that reed (*bova*) which grows in the swamps. Only Indians who fear nothing are able to put to sea in boats of such slight resistance. They collect the stalks and stems of this reed, they tie and bind them with long twigs, and continue giving it the shape of a small boat that is only able to carry one man, and when he has to enter the sea he puts it over his head and lets it fall, quickly putting himself aboard on his knees. [Sales, 1794, vol. 1, p. 29.]

On Cedros Island log rafts were in use (Ulloa *in* Wagner, 1929, p. 40) but there is no mention of their occurrence on the opposite mainland. Martínez, states that from Cape San Lucas to San Ignacio (lat. 23° to 27°) the Indians "got around in a sort of raft in the shape of a small boat, made of canes or rushes. With this rudimentary craft they will put out to sea until they are lost to sight for many hours, one man in each, with a double-paddle, which they manipulate on both sides, half kneeling, or squatting" (Martínez, 1938, p. 15). Taraval (1931, p. 51) notes balsas at Todos Santos. Inside Magdalena Bay (lat. 24°18′) Ulloa (specifically at Almejas Bay: Ulloa *in* Wagner, 1929, p. 31) saw "very large rafts of cane," probably to be understood as large tule balsas. As shown elsewhere, the log raft was used at Cape San Lucas. From Cape San Lucas northward to La Paz Bay inside the Gulf of California bark-log rafts were in use. Just south of La Paz at a bay, which in 1633 Francisco de Ortega called San Ignacio de Loyola, were seen Indians with small balsas (*balsillos*), and Taraval notes balsas in 1735 at Cerralvo Island in the same region (Ortega, 1633, p. 161; Taraval, 1931, pp. 74–75, 276).

North of La Paz among the Cochimi the balsa and double-bladed paddle continued in use on the coast. Ulloa has left a careful description of the Cochimi balsa at lat. 29°48′:

> They had a little raft which they must have used in fishing. It was made of canes tied in three bundles, each part tied separately, and then all tied together, the middle section being larger than the laterals. They rowed it with a slender oar, little more than half a fathom long, and two small paddles, badly made, one at each end. [Ulloa *in* Wagner, 1929, p. 22—at Bahia de San Luis Gonzaga.]

On the coast near Loreto, Vizcaino noted in 1596, "five canoes like *balsas* very well made with canes and strong, came out from the shore. In each were three or four Indians" (Vizcaino *in* Wagner, 1930, p. 211).

At Espiritu Santo Island, outside La Paz, Ortega in 1631 said that "many Indians came out to the ship in their (tule) balsas" (Ortega, 1631, p. 75).

North of the Cochimi people and inside the Gulf live the Peninsular Kiliwa and Akwa'ala whose culture is oriented toward the interior rather than seaward. It is probable that here the tule balsa was used when occasion demanded, but no definite evidence can be produced to support this possibility. The Cocopa were accustomed to use the tule balsa (Derby, 1932, p. 58), as were other tribes of the lower Colorado River.

On the west coast of Mexico south of the Colorado River delta the balsa is sporadically present. The Seri of the Sonora coast and Tiburon Island use both the tule balsa and double-bladed paddle (McGee, 1898; Kroeber, 1931, pp. 20–41; Davis and Dawson, 1945, pp. 196–197, fig. 5). The single occurrence of this paddle type on the Mexican mainland leads to the conclusion that the Seri learned of navigation, at least in part, from the peninsular tribes across the waters of the Gulf of California.

DUGOUT CANOES

On the northwestern California coast the dugout is the only means of navigation. It is a country of rivers, and the boats are used for both ocean and river travel. The "Yurok type" canoe used by the littoral Tolowa, Yurok, and Wiyot, is essentially suited to river travel because of its blunt, rounded prow and round, gently curved belly, and not to the sea and surf where a high-ended, keeled, and sharp-prowed type would be more practicable. It is clear that the dugout here has developed on the interior rivers, and later came out to the ocean.

The canoe is made of soft, straight-grained redwood. The excavation is done by controlled firing and shaping with a shell-bladed adz attached to a stone handle. The bow and stern rise only a foot above the level of the gunwales, which are wide and overhanging inward rather than flaring outside to prevent wash. The wide gunwales serve as longitudinal strengtheners. Inside the boat is a stern seat and in front of the seat are two foot braces.

The Yurok dugout has, according to Kroeber (1925, pp. 82–83) a standard length of 3 fathoms and a hand (18 feet), but varies considerably in breadth (3 to 4 feet) and depth (1 to 2 feet), which has the effect of increasing capacity, but not at the expense of maneuverability on the rocky river where the length of the boat is an important feature. The draft is shallow and the canoe rarely draws more than 6 inches in the middle when loaded. A shallow-draft canoe is suited to the rocky river rather than to the ocean, and is a further indication of the interior riverine development of this type.

The Yurok of Trinidad Bay on the northern California coast were early discovered by the Spanish, and from Fr. Benito de la Sierra's account of the Hezeta expedition of 1775 we have a description of the canoes which are said to have been at most 4 yards in length, well built, double-ended, and made of a single log. The stem and stern are stated to have been "half-decked," but the phrase is puzzling since the later boats here do not show any feature of this sort (de la Sierra, 1930, p. 222). Peter Corney (1896) described the Trinidad Bay canoes in 1817 as from 16 to 20 feet long, square at both ends, and flat-bottomed. Inside the boat were ridges, spaced about a foot apart, which looked exactly like frames or ribs of a boat and which served to strengthen the canoe. This last feature is not reported by other observers, and may possibly represent an effort in historic times to copy the frame feature of European boats.

South of the Wiyot, who use the same canoe as the Yurok and Tolowa to the north, the dugout is not employed. Kroeber (1925, p. 147) places Cape Mendocino as the southern limit of the dugout, which is a local and peripheral manifestation of the British Columbian and Alaskan coastal dugout-canoe area. (See Olson, 1927, and Barnett, 1937, p. 170.) The Mattole and Coast Yuki used no boats whatever on the coast. The Pomo used tule balsas on Clear Lake in the interior, but this form did not reach the coast in their territory. Occasionally the Pomo might use a makeshift log raft to visit mussel and sea lion rocks offshore (Kroeber, 1925, p. 243; Gifford and Kroeber, 1937, El. No. 258; Loeb, 1926, p. 182) but this temporary raft was hardly a standard feature of coastal Pomo culture.

Just south of the Pomo are the Coast Miwok of Bodega and Tomales Bay who, as we have already seen, used the tule balsa in their salt-water fishing. It is not until we reach the Luiseño of southern California that the aboriginal dugout canoe again is found (Sparkman, 1908, p. 200; Kroeber, 1925, p. 653). Here it exists side by side with the tule balsa, but the plank canoe did not diffuse from their northern neighbors, the Gabrieleño. Incidentally the Luiseño called the dugout pauhit, "yellow pine" (Kroeber, 1925, p. 654), and the Chumash call their plank canoe tomolo, "pine" (Heizer, 1941, pp. 60-61). This peculiar canoe-pine linguistic parallel can hardly be fortuitous, and leads one to suspect some specific connection between the Luiseño dugout and the Chumash plank canoe. This possibility is enhanced by the fact that for a long distance north of the Chumash and south of the Luiseño wooden canoes of any kind are unknown. How the development of these types occurred is impossible to say, nor is it easy to imagine what relationships the two boat forms have, since their occurrences are geographically exclusive and they are technologically distinct.

J. P. Harrington (1942, section on "Navigation") gives the late ethnographic (i.e., historic) occurrence of boat types in the Santa Barbara region as follows:

	N. Costanoans	S. Costanoans	Barbareño	Ventureño	Gabrieleño
Dugout canoe			×	×	×
Plank canoe			×	×	×
Tule balsa	×	×	×	×	×
Double-bladed paddle			×	×	×

We may be certain that the dugout was not used in early historic times (sixteenth to eighteenth centuries) in the Channel region, and it is not until the midnineteenth century that we find the first mention of the dugout in the Santa Barbara region in a newspaper account reproduced in Alexander Taylor's Indianology, where it is stated,

> They made canoes by digging out a solid trunk to contain four or five men, which were of remarkably neat model and handsomely bevelled, rounded off inside and out with hatchets made of stone, and scrapers and knives formed of shells. They were about thirty feet long and three or four deep and wide. The stern and bow were shaped alike, with a deep channel or groove for the anchor-rope to run through . . . these ropes were made from the fiber of the California wild maguey. [Woodward, 1934, pp. 120-121; Taylor, 1860.]

Thus, the Channel Barbareño and Ventureño seem to have used the dugout only in the past century. It was introduced either through the Spanish,[2] or from the Luiseño to the south. The Gabrieleño shared the plank boat with their Chumash neighbors to the north, but placed some reliance at least upon the tule balsa. There is no evidence, other than Harrington's check list, that the Gabrieleño used the dugout and we may suspect its late introduction here as among the Chumash.

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[2] For which there is no direct evidence, but must be considered a possibility. Note the historic introduction, by U. S. Army soldiers, of the dugout to the Pomo of Clear Lake (Gifford and Kroeber, 1937, p. 185).

LOG RAFTS

Log rafts, although rarely used, are hardly to be considered as a typical or characteristic means of navigation on the coast of Upper California. Gifford and Kroeber (1937, p. 145) list a raft of logs lashed together with withes for the northwestern and southwestern Pomo (Loeb, 1926, p. 182; Kroeber, 1925, p. 243). It was used by the people to visit offshore mussel-bearing rocks. Farther north the Sinkyone and Tolowa, whose territories front the ocean, claim to use the log raft, but whether this was for interior river or coastal lagoon service is unknown (Driver, 1939, section on "Navigation"). As with the dugout canoe in northwestern California, the log raft is more widely used in the interior, and its presence on the coast must be looked upon as due to spread from the hinterland.

Logs were used in Baja California on Cedros Island (lat. 28°15′) where cedar trees are common in the mountainous interior, near Cape San Lucas to the north of which pines grow on the slopes of the Sierra de la Victoria, and in the Bay of La Paz inside the Gulf of California north of Cape San Lucas. Boats constructed of logs were rafts and nowhere was the dugout used.

Ulloa, who visited Cedros Island in 1539, has left the following description of the raft seen at Morro Redondo (lat. 28°2′):

> They had five or six rafts which they had used in fishing, made of pine or cedar timbers, as long as 12 or 15 feet and so big that a man could hardly reach around them. The part under water is rounded, and where the people stand on them is flat. They are not hollow in any part. On each side, to maintain the balance, there are bundles of many cedar poles, closely tied together, as long as the canoes themselves. They rowed them with paddles two or three palms long and about three fingers across, at the end of each a three-cornered triangular piece of wood of this shape [arrowhead] five or six fingers from point to point. [Ulloa *in* Wagner, 1925, p. 52.]

This log raft appears to have been made of a single split cedar log stabilized by bundles of cedar poles lashed on each side. This is certainly a unique boat type for the Californias. Although the use of stabilizers is known in Oceania and Colombia (Hornell, 1928), we would draw no connection between these and the Baja Californian occurrence.

At La Paz Bay and probably referring to the Guaicurá (though possibly to the Pericu islanders of Espiritu Santo), Cardona in 1617 said—

> Their vessels are of three bundles of thin canes, two at the sides and one in the middle, very well tied in such a way that two persons travel on each of them. They also have another class of vessel which is of three logs fastened together. On each an Indian goes out to fish. They row with both hands, with an oar with two blades. [Cardona, 1868, p. 35.]

In the south near Cape San Lucas rafts described as "bark-logs" were used. These were apparently made of *Ceiba* (cork) logs, although the local pine may have also served for this purpose. Pines grow in the interior at high elevations, and it is not known whether the Indians could carry them down to the sea (Rogers, 1928, p. 231; Baegert, 1772, pt. 2, sect. 4). They were propelled with the double-bladed paddle and served the natives in fishing (Rogers, 1928, p. 231; Shelvocke, 1928, p. 226; Clavigero, 1937, p. 100). Shelvocke (1928, p. 226) describes the log raft as follows:

> . . . they go out to sea on their bark-logs, which are only composed of five logs of a light wood, made fast to one another by wooden pegs; on these they venture out rowing with a double paddle.

An earlier description by Clavigero reads—

> In order to fish on the high sea in this second way they use a simple raft composed of three, five, or seven logs fastened together with sticks and well tied; the log in the middle, which extends farther because of being longer, serves as a prow. The wood from which these rafts are made is cork (a tree already described by us), because it is lightest. On each of them, according to their size, 2 or 3 men take their places and depart 4 or 5 miles from the coast, without fear of the very high waves of the Pacific Sea, which at times, seem to lift them as far as the clouds and at times to bury them in the bottom of the sea. [Clavigero, 1937, p. 100.]

Clavigero refers again (op. cit., p. 50) to the "Corcho" from which the Indians make rafts. This is to be identified with the *Ceiba acuminata.*

The combination of a raft and the double-bladed paddle presents such a degree of discordance as to lead to the conclusion that the raft in this region was possibly a recent introduction to a people who already knew the balsa and double paddle, or that the paddle was borrowed from natives in the Gulf where it is the common means of propulsion.

PLANK CANOES

In the whole coastal area from the California-Oregon boundary to the southern tip of Baja California is a single small littoral strip where multiplank canoes were used. This restricted area is the Santa Barbara Channel, which was occupied in ethnographic times by the Chumash Indians. The plank boat was in use on the mainland between Point Concepcion (lat. 34°50′N., long. 121°50′ W.) and Point Dume (lat. 34° N., long. 119°15′ W.) and on the offshore islands of Santa Barbara, Santa Rosa, and San Miguel at the time of the early Spanish explorations (1542–1770). The plank boat was not used by the Luiseño, Juaneño, or Diegueño so far as known. The relatively sheltered waters of the channel seem to have permitted the safe employment of this boat, and to this extent environmental determinism may be assumed to have operated. North of Point Concepcion the rocky unsheltered coast was hardly suitable for employment of the fragile plank boat, and there is no evidence of its presence in early historic times. Cermeño in 1595 noted the tule balsa at San Luis Obispo Bay (lat. 35°20′) some forty-five miles north of Point Concepcion (Wagner, 1929, p. 161; 1924, p. 16). But in 1775 Pedro Fages mentioned plank canoes in this same bay (Fages, 1937, pp. 51–52; see also Wagner, 1929, p. 371), as did Vancouver in 1793 (Vancouver, 1798, vol. 2, p. 445). This conflict in evidence would lead one to suspect a local replacement of the original tule balsa by the plank boat in post-Hispanic times. Documentary evidence for such introduction and substitution is to be found in the statement of Fr. Pedro Font in 1776 that their expeditionary force escorted six Christian Indians from Mission San Luis Obispo to the Santa Barbara Channel where they bought, with glass beads, two plank canoes. The Spanish party continued on south, the Obispeño returned to their home with the boats (Bolton, 1930, p. 453). The exact date of the first transfer to San Luis Obispo Bay of the southern plank boats cannot be determined, though it could hardly have been much before 1772, since Mission San Luis Obispo was founded at that time. The boat Vancouver saw was undoubtedly one of the imported Channel Chumash canoes.

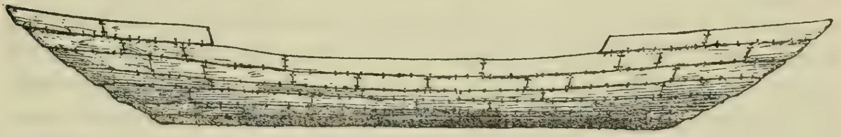


FIGURE 12.—The Chumash plank canoe.

The construction and form of the Chumash plank canoe has been treated fully in other papers (Woodward, 1934; Heizer, 1938, 1940 b, 1941; Robinson, 1942; Kroeber, 1925, pp. 558–559), and these points need only be summarized here. The average canoe measured about 25 feet in length (range 12 to 30 feet), 3 to 4 feet in breadth, and about 3 feet in depth. The foundation of the boat was a heavy flat-bottom plank with two end posts bound on with cords through drilled holes. Taking off from each side of the base plank at an angle of 50 to 60 degrees, were longitudinally laid planks, each about 3 feet in length, 6 inches wide, and a half inch thick. Each short plank was tied on all four edges to the adjoining planks by sewing through drilled holes. Each course of planking was calked with quantities of asphaltum applied when hot and viscous. The canoe had no internal ribs or frames, and was strengthened solely by means of a center gunwale thwart which also served as a seat. From the descriptions of the boat which have come down to us in historical accounts, one gets the impression that the canoe was a rather weak and unstable craft. This, however, was not the case—the canoe was of light weight and flexible construction, and the weight of the paddlers who kneeled in the bottom tended to draw the gunwales together and tighten the seams (Heizer, 1940 a). The liberal quantities of asphaltum used undoubtedly were helpful in making the boat seaworthy, and it is diffcult to imagine the Chumash canoe without this asphaltum which was so abundant in their territory. The plank canoe had an unusual profile. The planking at the bow and stern was elevated, leaving the center gunwales low. The reason for this feature was probably to prevent a following wave from coming into the boat when landing in the surf. Three or four people at most were all that were observed to ride in one of these boats, although early explorers repeatedly estimate that the canoes had a potential capacity of 8 or 10, or even 20. Thus size was a misleading factor to the Spanish observers, while the Indians undoubtedly knew from long experience how many could safely ride in the plank canoes. The double-bladed paddle was used to propel these ocean-going canoes, and they were well made with the blades mortised to the handle. The paddle was from 6 to 10 feet in over-all length.

Some of the more detailed descriptions by early observers are given below—others may be consulted in the special papers on the Chumash plank canoe (Heizer, 1938, pp. 194–207; Robinson, 1942, pp. 203–209). Miguel Costanso, engineer of the Portola expedition of 1769–70, says:

> The expertness and skill of these Indians is unsurpassed in the construction of their canoes of pine boards. They are from eight to ten yards in length from stem to stern post, and one yard and a half in breadth. No iron whatever enters into their construction and they know little of its use. But they fasten the boards firmly together, making holes at equal distances apart, one inch from the edge, matching each other in the upper and lower boards, and through these holes they pass stout thongs of deer sinews. They pitch and calk the seams, and paint the whole in bright colors. They handle them with equal skill, and three or four men go out to sea to fish in them, as they will hold eight or ten men. They use long double-bladed oars, and row with indescribable agility and swiftness. . . They hold intercourse and commerce with the natives of the islands. [Costanso, 1910, pp. 136–139.]

Fr. Pedro Font wrote in 1776 of the Chumash plank boat, and his description has come down to us as the best single detailed account:

> The Indians are great fishermen and very ingenious. . . Above all, they build launches with which they navigate. They are very carefully made of several planks which they work with no other tools than their shells and flints. They join them at the seams by sewing them with strong thread which they have, and fit the joints with pitch, by which they are made very strong and secure. Some of the launches are decorated with little shells and all are painted red with

> hematite. In shape they are like a little boat without ribs, ending in two points somewhat elevated and arched above, the two arcs not closing but remaining open at the points like a V. In the middle there is a somewhat elevated plank laid across from side to side to serve as a seat and to preserve the convexity of the frame. Each launch is composed of some twenty long and narrow pieces. I measured one and found it to be thirty-six palms long (24 to 26 feet) and somewhat more than three palms high (2 to 3 feet). In each launch, when they navigate or go to fish, according to what I saw, ordinarily not more than two Indians ride in each end. They carry some poles about two varas long which end in blades, these being the oars with which they row alternately, putting the ends of the poles into the water, now on one side and now on the other side of the launch. In this way they guide the launch wherever they wish, sailing through rough seas with much boldness. [Bolton, 1930, pp. 252–253.]

Archibald Menzies, naturalist of the Vancouver expedition, described the Santa Barbara canoes in 1795 as:

> . . . from 14 to 18 foot long and in the middle about four feet wide and tapering to both extremities. They were made of different pieces of wood curiously sewd together, their Paddle was about half the length of the Canoe and bladed at each end so as to be held by the middle and used alternately on each side. . . . [Menzies, 1924, p. 315.]

In another place Menzies gives further data on the canoe:

> The make and formation of their Canoe shewd no small degree of ingenuity as it is regularly built of different pieces of boards of various sizes and figures and neatly fastened together with Thongs and Sinews & glewed so close as to be quite water tight and preserves its shape as well as if it had been made of one piece, without any other timber to strengthen it but one small thort in the middle, from thense it rises gradualy & tapers to both extremities, where it is double pointed by a small notch at each end— These Canoes are from 12 to 18 feet in length & in the middle about 4 feet wide, they are large enough to carry about half a dozen of the Natives in smooth water and are extremely serviceable to them for the purpose of fishing in the channel as we had the pleasure to experience during our stay by the plentiful supply of Fish they daily brought us— Canoes made in this manner are to be met with no where else in California, & the inducement to form these of such scanty materials might probably originate in a desire of visiting & keeping up an intercourse with the adjacent Islands which as the sea is smooth and the climate is serene is frequently affected without danger.— Their paddle we have already seen is about half the length of the Canoe, bladed at both ends & used alternately on each side. [Menzies, 1924, pp. 325–326.]

THE DOUBLE-BLADED PADDLE IN THE NEW WORLD

At an earlier time it was felt that the isolated occurrence of the double-bladed paddle at San Francisco Bay and the Santa Barbara Channel (for long the only recognized California instances) presented a problem referable in some manner to the classic Eskimo use of this instrument (Kroeber, 1925, p. 559). In the present paper we have established the fact that the double-bladed paddle is found along the east and west coasts of Baja California, at San Diego, Santa Barbara, Monterey Bay, San Francisco Bay, Drake's Bay, and Bodega Bay. Here is clearly a continuous and unitary distribution of this instrument. The presence of this type of paddle among the Seri of the north Mexican mainland is most easily explained as having been adopted from the Peninsular tribes (Cochimi?) who, at least with reference to the Seri, form a local center of gravity.

Birket-Smith (1929, p. 262, table A51) lists the double paddle among the following New World Eskimo groups: Northeast Greenlanders, East Greenlanders, West Greenlanders, Polar Eskimo, Labrador, Baffin Island, Iglulik Eskimo, Southampton Island, Caribou Eskimo, Netsilik Eskimo, Copper Eskimo, Mackenzie Eskimo, Point Barrow, Bering Strait region, Pacific Eskimo (Koniag), and Aleut. The Chukchi and Koryak on the adjoining coast of northeastern Asia also know this instrument.[3]

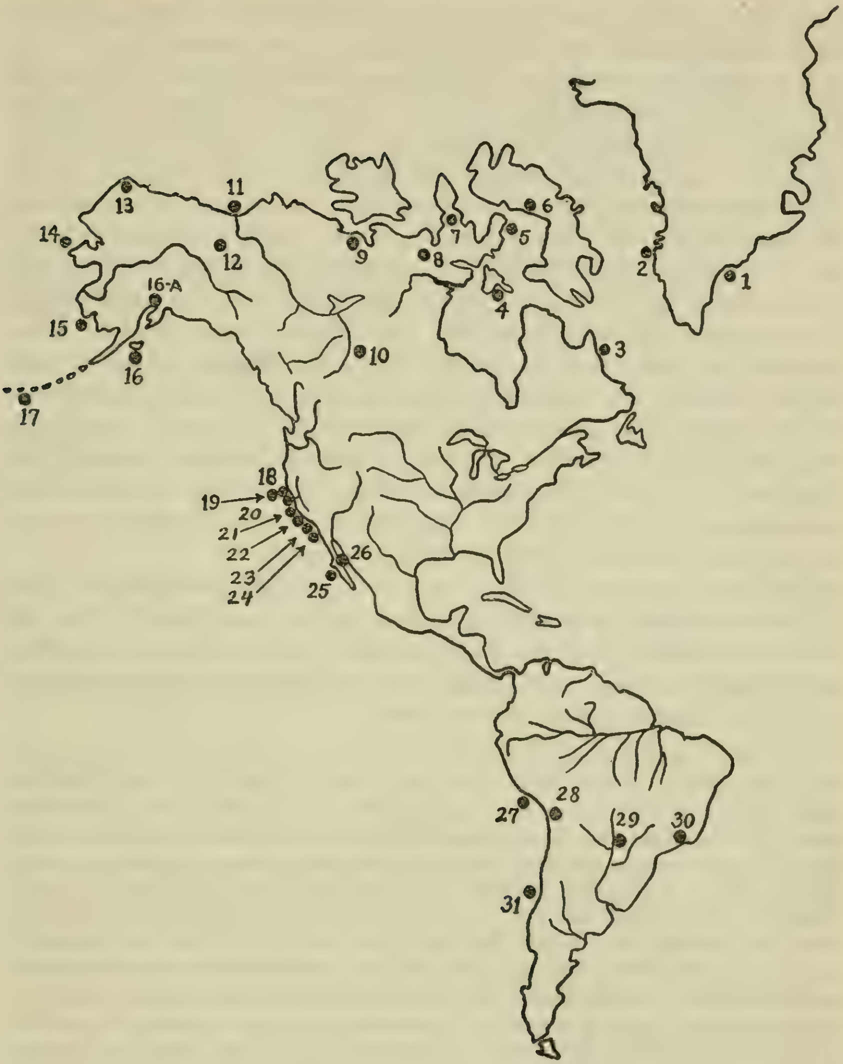
In South America the double-bladed paddle is known by the Agaces Indians of the Rio Paraguay, the Tamoyos on the Rio de Janeiro, from northern Chile, and archeologically from Arica (Nordenskiöld, 1931, pp. 88–89, map 22). As Birket-Smith (1929, p. 174) points out, there is some evidence that European sportsmen and African slaves may have introduced the double-bladed paddle into certain parts of South America and the southern United States. Lothrop (1932, pl. 21, fig. *b*; pl. 20, figs. *a*, *b*; p. 242) shows that the double-bladed paddle was used to propel the seven-plank dalca and the sealhide float of Chile.[4]

From these data it would appear that the double-bladed paddle has had a complicated, and in several instances, a local and independent history of development. The Eskimo block may or may not be connected with the Asiatic occurrences, and for a discussion of this problem we refer the reader to Birket-Smith (1929, pp. 79, 174–175). The great gap between the southernmost Eskimo (Koniag) and northernmost Californian occurrence (Bodega Bay) of the double-bladed paddle seems to be an area which has never known this implement. The gap between the southernmost Californian (Cape San Lucas) and the nearest South American occurrence (Peru) is again so large that we are left with the only possible explanation of the California distribution block as historically independent and unrelated

---

[3] Also in Asia it is recorded for the Yukaghir, Chuvantsi, Kolyma Russians, Kuril, Goldi, Manegir, Orochi, Daurians, Olcha, Lamut, Tungu, Manchu, Yakut, Yeneseians, Samoyed, and (?) Zyryans (Birket-Smith, 1929, pp. 340–341, table B37.) This paddle form has also been noted from the Danish peat bogs (Late Paleolithic?) and from Yemen. In Africa it is known in Cameroon (Birket-Smith, 1929, p. 174). Pitt-Rivers (1906, p. 206) mentions its occurrence on the Egyptian Upper Nile and in the Sulu Archipelago.

[4] In addition to the illustrations in Lothrop's paper, we call attention to the double-log raft with lattice decking from the Chilean coast shown by Poeppig (1835, vol. 1, pp 304-305, atlas). The Peruvian coast sealhide float and double paddle at Iquique Island (latitude 19°50′ S.) are noted by Shelvocke. This account also contains an excellent description of the Chilotan three-plank dalca. As a further addition to Lothrop's data, see the sixteenth-century drawing of the Peruvian sailing catamaran in Taylor (1932, pl. opp. p. 366).



MAP 7.—Distribution of the double-bladed paddle in the New World.

1., E. Greenland Eskimo. *2*, W. Greenland Eskimo. *3*, Labrador Eskimo, *4*, Southampton Island Eskimo. *5*, Iglulik Eskimo. *6*, Baffin Island Eskimo. *7*, Netsilik Eskimo. *8*, Caribou Eskimo. *9*, Copper Eskimo. *10*, Chipewyan. *11*, Mackenzie Eskimo. *12*, Kutchin. *13*, Point Barrow Eskimo. *14*, Bering Strait Eskimo. *15*, Nunivak Island Eskimo. *16*, Pacific Eskimo (Koniag). *16–A*, Tanaina. *17*, Aleut. *18*, Coast Miwok (Bodega Bay). *19*, Coast Miwok (Drake's Bay). *20*, Costanoan (San Francisco Bay). *21*, Costanoan (Monterey Bay). *22*, Chumash (Sta. Barbara Channel and Islands). *23*, Gabrieleño (Sta. Catalina Island). *24*, Diegueño (San Diego Bay). *25*, Baja California tribes (Kiliwa, Cochimi, Pericue, etc.). *26*, Seri (Tiburon Island). *27*, Peruvian Coast. *28*, Arica (archeological occurrence). *29*, Agaces (Rio Paraguay). *30*, Tamoyos (Rio de Janiero). *31*, Chilean coast.

Sources for map occurrences: *1–14*, *16–17*, Birket-Smith, 1929; *15*, Margaret Lantis, information; *16–A*, Osgood, 1937; *18–26*, from data enclosed in this paper; *28–30*, Nordenskiöld, 1931; *31*, Lothrop, 1932.

to other New World areas of use of this paddle form. How and where, then, did the California double-bladed paddle originate?

The distribution maps of this paper indicate that the double-bladed paddle has a wider distribution than either the log raft, dugout, or plank canoe, and approximates most closely the distribution of the balsa. Apparently the double paddle is old—perhaps as old as the balsa on the coast, and almost certainly older than the log raft (of Baja California), the dugout (Luiseño), or plank canoe (Santa Barbara Channel). For all practical purposes, we can only decide that the balsa and double paddle are the oldest boat and paddle forms on the coast south of Bodega Bay, and that the other types of boats (dugout, log raft, plank canoe) are later developments which have simply adopted the preexistent paddle type. To some extent the double paddle must have had an effect upon the form of these later boats, for it is of necessity that only a narrow boat can be propelled with such a paddle. The problem of the age of the northern California dugout is referable to that of the antiquity and spread of dugout boats on the Northwest Coast proper.

Kroeber seems to have hit upon the probable manner of origin of the double-bladed paddle, and it is to be noted that he was, at the time he wrote, unacquainted with its fuller Californian distribution which has been established here. Kroeber says, in discussing the double-bladed paddle of the Seri:

> This type of paddle is established for the Seri, Santa Barbara islanders, the San Francisco Bay Indians, then apparently is lacking until the Eskimo-Aleutian area. Among the Chumash it is native and associated with the plank-built canoe. On San Francisco Bay it was used with the rush balsa, and may or may not be due to Aleutian sea-otter hunters introduced by the Russians.[5] It seems possible that the Seri and Chumash occurrences would prove connected by occasional use in Baja California if we had fuller data, since some of the natives there went several leagues out into the open sea. We are so accustomed to think of the two-bladed paddle as an adjunct of the specialized kayak, that it too impresses as a complicated device, inappropriate with a simple raft. As a matter of fact, wherever scarcity of wood, or lack of skill and usage in working it resulted in a paddle blade being cut separately from the shaft, the inventive step from attaching one blade to attaching two blades would have been insignificant—in fact, would be an improvement or variation rather than an invention.[6] The determining factor as to its adoption would probably be the type of navigation as set by water conditions. This is borne out by the distribution of the double paddle, which clings to areas of open salt-water navigation or large bays approxi-

---

[5] The double paddle is attested for the San Francisco Bay Costanoans long before the Russians began their penetration into California.

[6] This is no doubt true, but as we have shown in this paper, many of the California double paddles were made by simply flattening each end of a pole. (See pl. 20.) The single-piece paddle with narrow blades is presumably a rude imitation of the better-finished composite form of, for example, the Chumash (pl. 21). Not all Chumash paddles were so well made. (See the illustration of a paddle blade in Robinson, 1942, fig. 21.) The Pomo, according to Gifford and Kroeber, (1937, p. 185, ftn. 526), made single-bladed paddles with a detachable blade.

> mating open water conditions. On rivers and lakes the double paddle would rarely help and often be in the way. In this way the varying association with skin boat, wooden boat, and raft boat seems accounted for. Another factor must be the size of the vessel navigated. A broad or high canoe would scarcely allow of alternate paddling on both sides. This may be the cause of the absence of the implement on the Northwest Coast. Whether the Arctic and the California-Seri occurrences are to be historically connected, must probably be left an open question for the present. An answer in favor of connection will evidently depend on the establishment of sufficient other connections to set up a favorable presumption. Until then, the considerations just mentioned make the possibility of independent origin equally plausible. [Kroeber, 1931, pp. 20–21.]

The question of where the Californian double-bladed paddle originated is more difficult to answer. As Kroeber indicates, it is not used in the interior on rivers or lakes, and seems to have spread solely along the coast via the open coastal salt-water line of contacts. The balsa extends in the interior as far as the peripheral Thompson and Klamath (Wilkes, 1844, vol. 5, p. 253), but south of here is found in ever increasing use. On the coast it terminates in the north at Bodega Bay. There is, from these facts, presumptive evidence that the balsa has spread northward with its means of propulsion, the double paddle. Where in the south should we look for the place of origin of this paddle? Hardly to Baja California among the culturally and manually backward groups. This leaves us with the Santa Barbara Channel region among the Chumash, accomplished and dexterous woodworkers and authors of a technologically advanced civilization. Although acceptance of this theory of a Channel origin of the double-bladed paddle necessitates adherence to the additional hypothesis of a subsequent northward and southward coastal diffusion, this latter seems not improbable, since intergroup contacts along the coast have probably always existed. This suggestion begs the question of how the double paddle became associated with the balsa, and the history of both types subsequent to their adhesion.

For the history of the double-bladed paddle in the New World we offer the following suggestions. The Californian coastal occurrences may be considered an historical unit, with a possible locus of origin among the Chumash of the Santa Barbara Channel at a time before the development of the plank canoe. The presence in California of this paddle form is historically independent of that of the Eskimo unit far to the north, and of the South American occurrences far to the south. Thus, on the basis of the New World data alone, there is presumptive evidence that the double paddle has had at least three separate and independent developments. Offhand, the several widely separated South American occurrences may indicate plural origins there, and the Old World examples, some isolated and remote, may be considered other evidence, if such be needed, that Kroeber's suggestions of the technological ease of the invention of this paddle form may be accepted. Theoretically within the Californian coast area there may have been plural origins, although the continuous geographical distribution of the form among relatively simple and uninventive groups could hardly be considered strong support for such an hypothesis.

R. F. H.
May 1952

NOTE

Since this paper was written 10 years ago, some new information on boats of the pacific coast has become available. In particular there should be mentioned the excellent summary of Mayan and Mexican canoes and navigation by J. E. S. Thompson (1951) which effectively closes the last major gap in a series of syntheses of aboriginal navigation from Tierra del Fuego to Bering Strait. It should now be easy to discuss Pacific coast navigation as a unit from the historical point of view.

The monumental handbook of South American Indians unfortunately lacks a summary of boats, though the several regional survey volumes contain the essential data. A recent work by Castillejo (1951) on Arawak and Carib boats is useful.

The Baegert account of Baja California has recently been translated by M. Brandenburg and C. Baumann and published by the University of California Press (1952).

R. F. H.
May 1952

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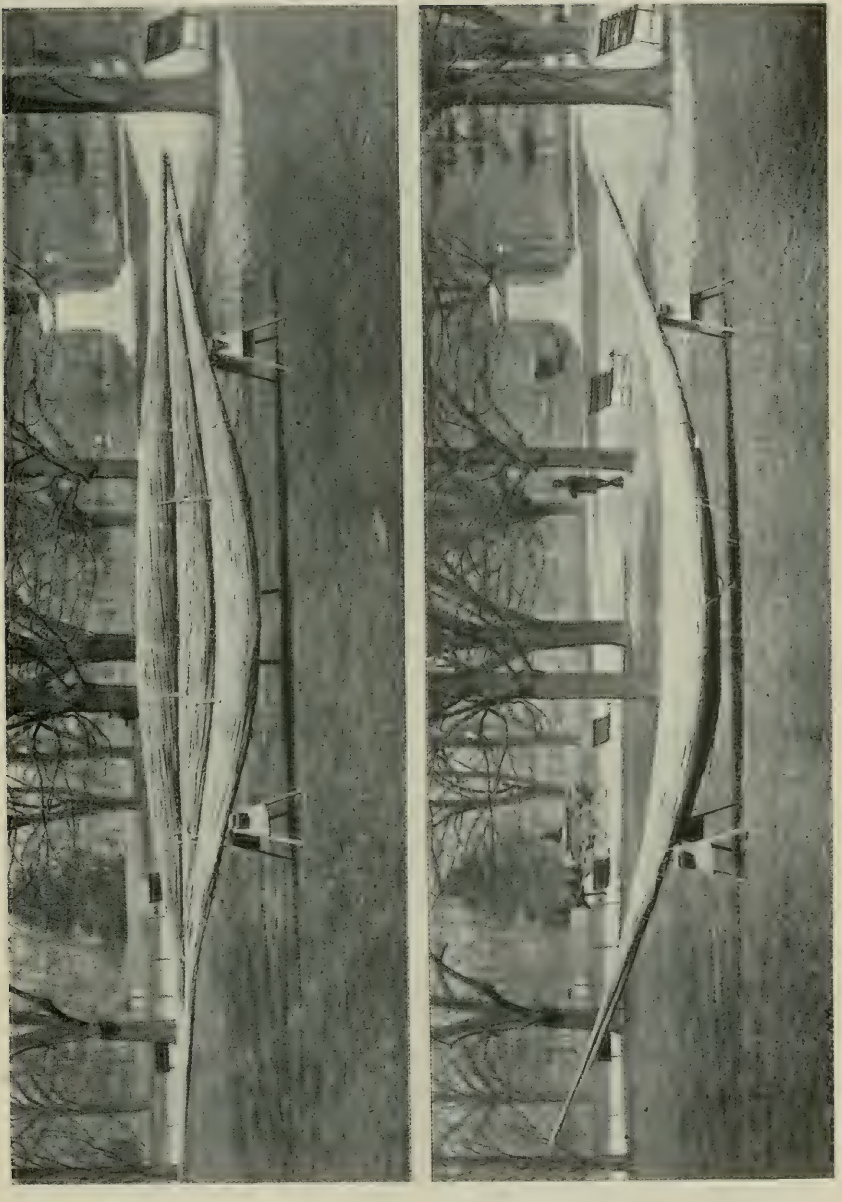


SERI BALSA.
After McGee.

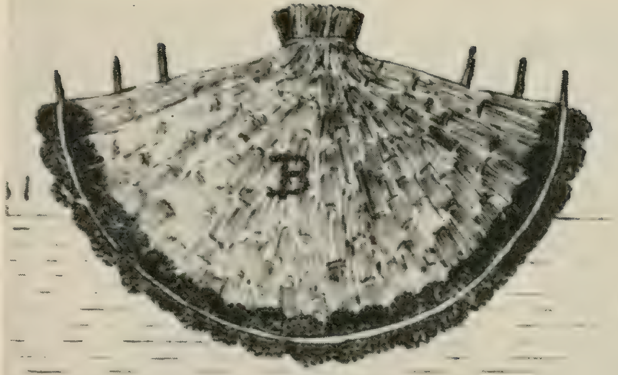


Fig 2

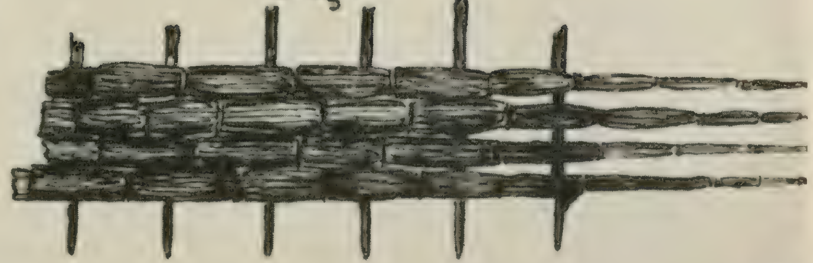
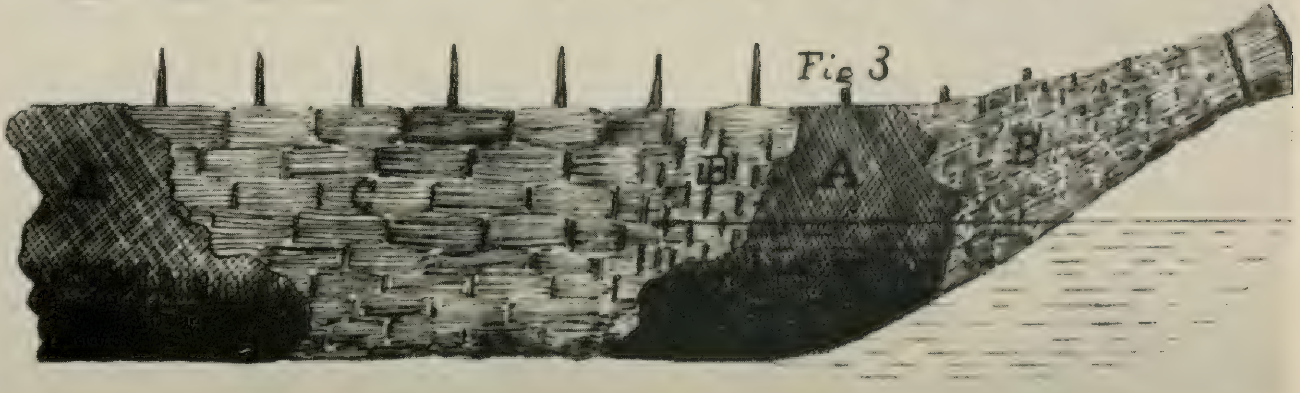
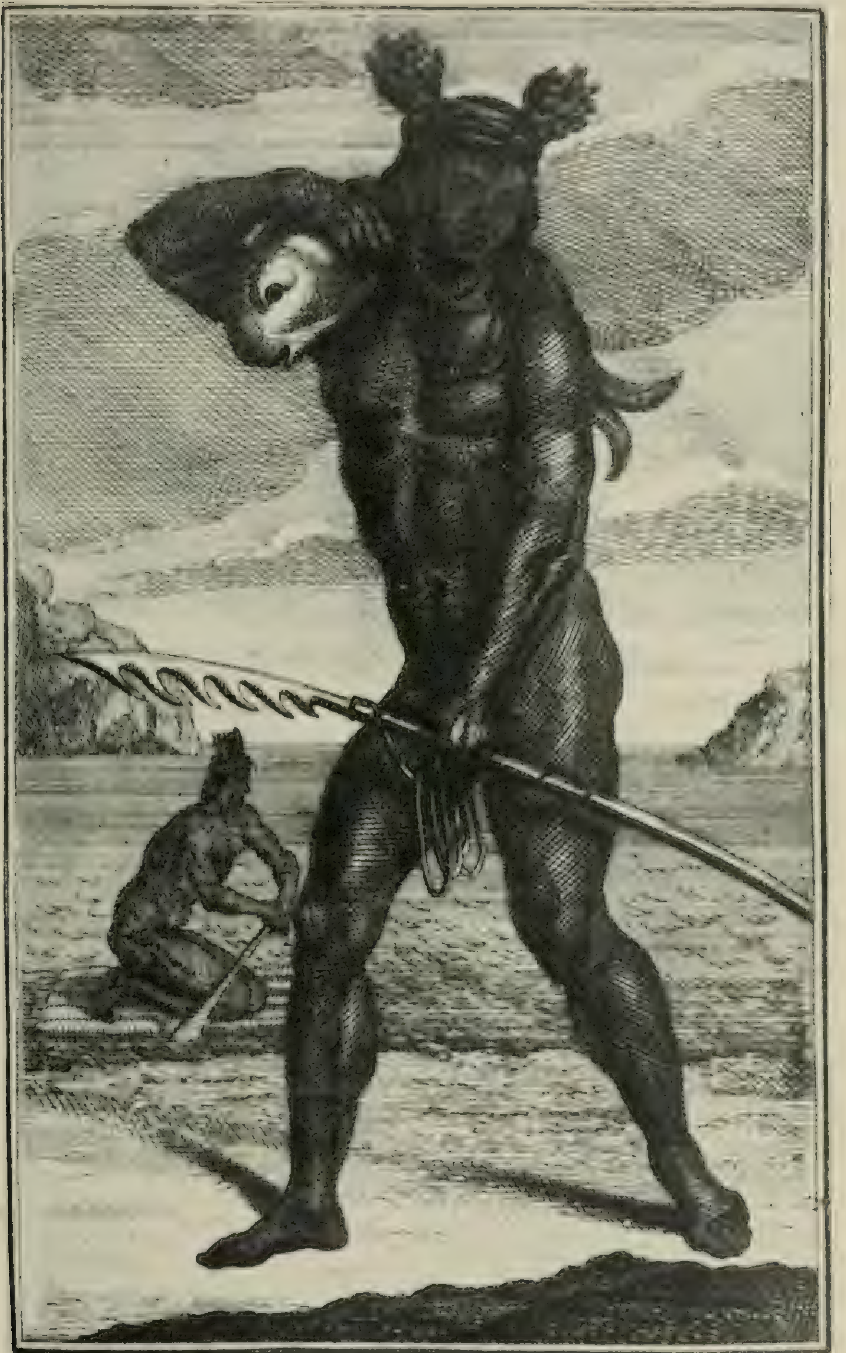


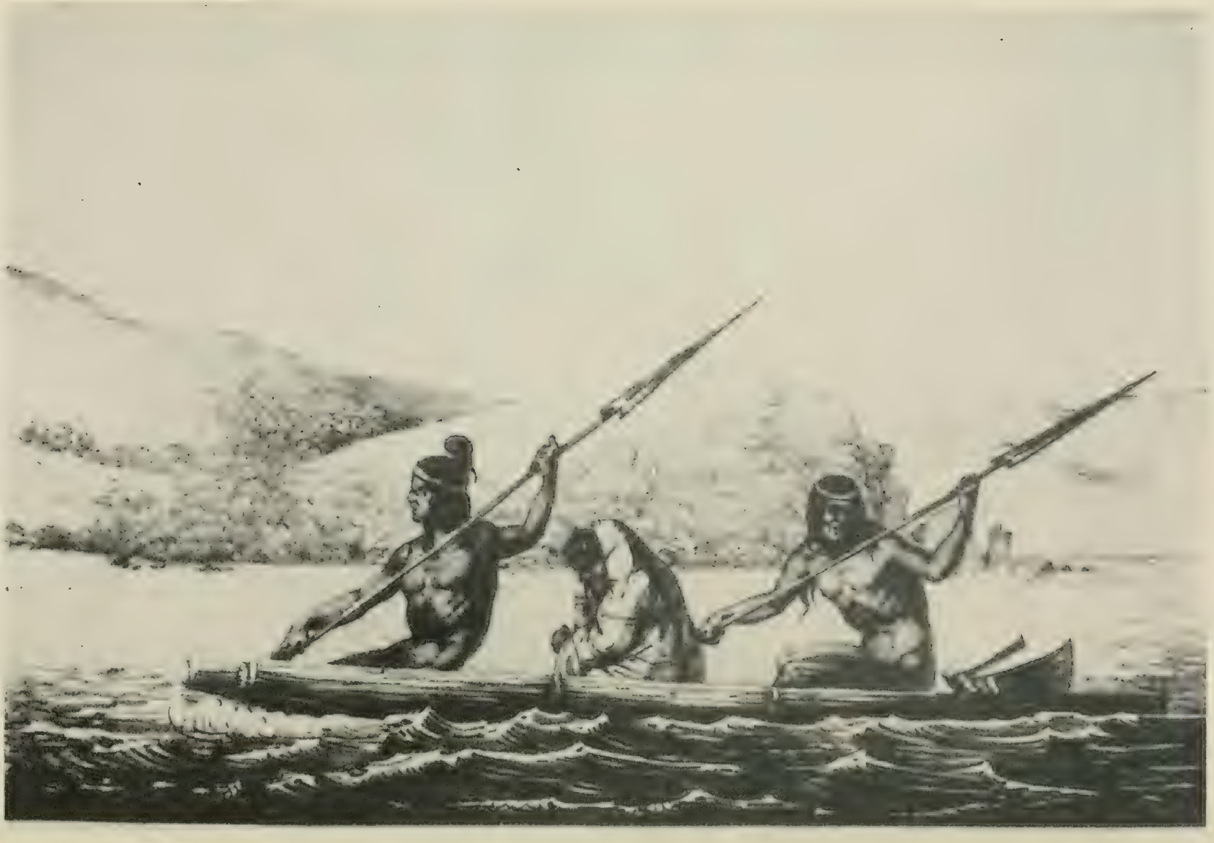
Fig 3



TULE BALSA FROM SANTA BARBARA CHANNEL.


An Indian of ye Southermost parts of California
as Returning from Fishing & another on his Barklog

A BARK-LOG RAFT OF BAJA CALIFORNIA.



Balsa and Double-bladed Paddle in San Francisco Bay.

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Exploration of an Adena Mound at Natrium, West Virginia

By RALPH S. SOLECKI

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EXPLORATION OF AN ADENA MOUND AT NATRIUM, WEST VIRGINIA

By Ralph S. Solecki

INTRODUCTION

Through the cooperation of the Smithsonian Institution and the Pittsburgh Plate Glass Co., one of the few remaining earth mounds of the Adena[1] culture on the Ohio River was excavated at Natrium, W. Va., during December 1948 and part of January 1949. The chemical company owns the property on which the mound was situated (fig. 13). To the writer's knowledge, only one other tumulus in the East—that on the property of the Wheeling Steel Corp. at Beech Bottom, W. Va.—has ever been opened with the aid of an industrial enterprise.

Natrium Mound, of medium proportions, was totally explored in record time during unseasonal working conditions. It yielded a wealth of data pointing to late Adena affiliations. There are a number of interesting new artifact traits represented among those of the more usual Adena types. Fifty-one features are noted, of which 22 were unmistakably burials containing osseous material. Presumably many of the other features may have been burials also, but all skeletal evidence had disappeared.

This earthwork had been in danger of destruction at least twice. Delf Norona of Moundsville, W. Va., deserves credit for originally bringing the attention of the mound's plight to the Smithsonian Institution about 5 years ago. The Pittsburgh Plate Glass Co., which had contemplated destroying the mound at that time, subsequently abandoned the plans, only to revive them again 3 years later. This time, Joseph H. Essington,[2] in a letter dated October 4, 1948, which he wrote to the Bureau of American Ethnology, Smithsonian Institution, appraised the situation. He informed Dr. Frank H. H. Roberts, Jr., Associate Director of the Bureau, who carried out the initial necessary steps for the research, that the Pittsburgh Plate Glass Co. was willing to cooperate in the mound exploration. After some correspondence was exchanged between the interested parties, arrangements were made for the removal of the mound. Controlled archeological methods were used. The writer was authorized to supervise the exploration for the Smithsonian Institution. It was stipulated that the Pittsburgh Plate Glass Co. would provide four workmen for the labor. Mechanical excavating equipment, such as was required, would also be provided. The total estimated time in working days for the completion of this project was 20 days. It was through the kind efforts of Earl Wolf, plant superintendent of the Columbia Chemical Division of the chemical company, that these requirements and conveniences were met.

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[1] The Adena culture takes its name from historic "Adena," near Chillicothe, Ross County, Ohio, the pretentious estate of Thomas Worthington, early governor of Ohio. The type mound of what since has been called the Adena culture was first examined and reported on that estate in 1901 by William C. Mills (Mills, 1902; Shetrone, 1930, pp. 167–168).

[2] Mr. Essington, a civil engineer, was employed during that period by the Columbia Chemical Division of the Pittsburgh Plate Glass Co. of New Martinsville, W. Va.

Excavation was started on December 7, 1948, the day following the writer's arrival on the site. Mr. Essington acted as assistant supervisor when he could find opportunity from his other regular duties at the plant. It was fortunate that several volunteers helped with the more painstaking and time-consuming tasks of the excavation. These men were Delf Norona, Sr., and Delf Norona, Jr., of Moundsville, William and Robert Athey of New Martinsville and Proctor, and Oscar Mairs of Charleston, W. Va. These men gave freely of their time, rendering invaluable assistance while the writer was engaged in the more technical aspects of the mound excavations. Without their help, in the press for speed, the record would certainly have been less complete. The workmen also showed a keen interest, indeed became quite expert in their unaccustomed tasks. Naturally, the green crew had to be trained during the progress of the exploration.

In the preparation of this report, the writer is indebted to the following persons who made laboratory studies of the mound materials: T. Dale Stewart, Department of Anthropology, George S. Switzer and Edward P. Henderson of the Department of Geology, all of the United States National Museum; George Ellinger of the National Bureau of Standards; and Robert M. Salter of the Department of Agriculture. Thanks are also due to Dolores Nourse for her assistance in the preparation of the manuscript.

THE MOUND

The mound was situated on a field adjoining the chemical plant at Natrium, 12 airline miles south of Moundsville and 8 airline miles north of New Martinsville. The property, a fairly level tract of land called Wells Bottom, had formerly been part of the Arrick farm. The mound was conspicuously situated within view of the factory and the State highway on the second bottom or terrace above the Ohio River. It was 1,100 feet from the left bank of the river and 250 feet from State Route No. 2, at an elevation of 680 feet mean sea level. The sparsely wooded hills fronting the Ohio Valley rose steeply 650 feet to the northeast of the mound.

Like the Beech Bottom Mound farther north (Bache and Satterthwaite, 1930, p. 134), the top of Natrium Mound had been dug into by "pot-hunters," and the south side had been disturbed in modern times.

This aboriginal feature, designated 46 Mr–2 in accordance with the trinominal system of site designation adopted for West Virginia (Solecki, 1949, p. 5), was not without neighbors. Another, and larger earth mound, is situated approximately three-fourths of a mile north of the Natrium Mound on Wells Bottom.[3] It is also on the property of the Pittsburgh Plate Glass Co., but formerly belonged to the Wells family. A double or twin earth mound is situated at Captina, 5 airline miles north of Natrium. One of the most famous of all mounds, the Grave Creek Mound at Moundsville, W. Va., is only a few minutes' drive to the north. The latter tumulus, a conspicuous one, has excited speculation since the first time it was observed by white man. A mound had been recorded in New Martinsville, but this earthwork had been destroyed without a trace during the expansion of this town in the nineteenth century. (Hennen, 1909, pp. 18–19).

A comparative analysis of Adena culture or complex was first made by E. F. Greenman (1932), who listed its diagnostic traits, comparing evidence from 70 sites in 5 States on the Ohio River. Subsequently the Adena culture was termed as part of the Burial Mound I Stage, or the beginning of a series of four mound-building stages in the east (Ford and Willey, 1941, pp. 334-338). Webb introduced additional material to the study of the Adena culture in a later work (Webb and Snow, 1945), systematically synthesizing this culture complex and its ramifications. Southern central Ohio and its immediate adjoining area seems to have been the most heavily concentrated region of the Adena culture (Webb and Snow, 1945, map 1, pp. 132-136).

The mounds suggest a sedentary population which left evidence of its social and religious structure. Pottery, although scarce, is present and agriculture seems to have been known. Hence, we may conclude that the Adena people included pottery and agriculture in their economy (Setzler, 1940, p. 268; Webb and Snow, 1945, pp. 313-314). In Griffin's (1943, p. 306) words, the Adena culture appears ". . . to represent a more highly institutionalized burial complex of the first semisedentary agricultural populations of the area."

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[3] Wills De Haas (n. d.) in the late nineteenth century cryptically notes a mound at "Wells, above Proctor."

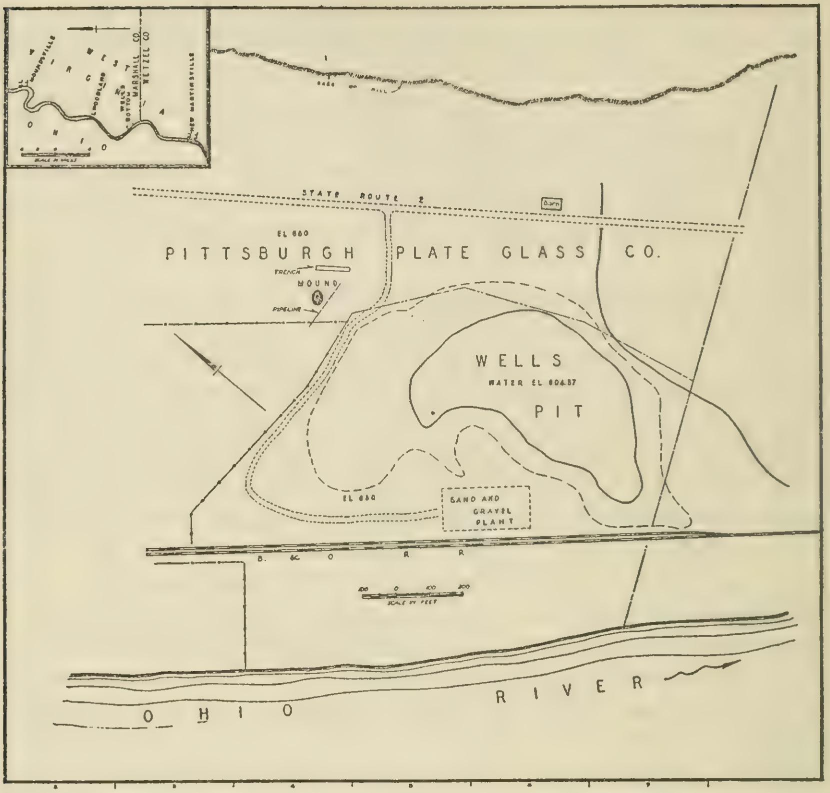
WEST VIRGINIA
MOUNDSVILLE
WOODLAND
WELLS BOTTOM
MARSHALL CO.
WETZEL CO.
NEW MARTINSVILLE
OHIO
SCALE IN MILES
STATE ROUTE 2
Barn
EL 680
PITTSBURGH PLATE GLASS CO.
TRENCH
MOUND
PIPELINE
WELLS PIT
WATER EL 604.37
EL 680
SAND AND GRAVEL PLANT
B. & O. R. R.
100 0 100 200
SCALE IN FEET
OHIO RIVER

FIGURE 13.—Map showing location of Natrium Mound.

Map prepared by Joseph H. Essington.

THE MOUND EXCAVATION

A certain amount of preparation had to be made in order to ready the mound for test excavation. A telephone company had taken advantage of the eminence by erecting a pole for the wires on the mound summit. This had to be removed before work could begin. There was a dense growth of scrub trees and bushes on the mound dominated by a large cherry tree, 2 feet thick at the base. These also had to be removed.

Mr. Essington and another engineer from the plant surveyed the mound in 1-foot contours (fig. 14), enabling the writer to attend to other preliminary duties. The tumulus presented an ovate or kidney-shaped outline in ground plan, since earth had been removed about 50 years ago from the southeastern side for use in a fill. It was reported that when the elder Mr. Wells had cut into the mound side for soil, he had unearthed several aboriginal artifacts. At least this report was encouraging. The mound proper was 9.5 feet high and about 55 feet

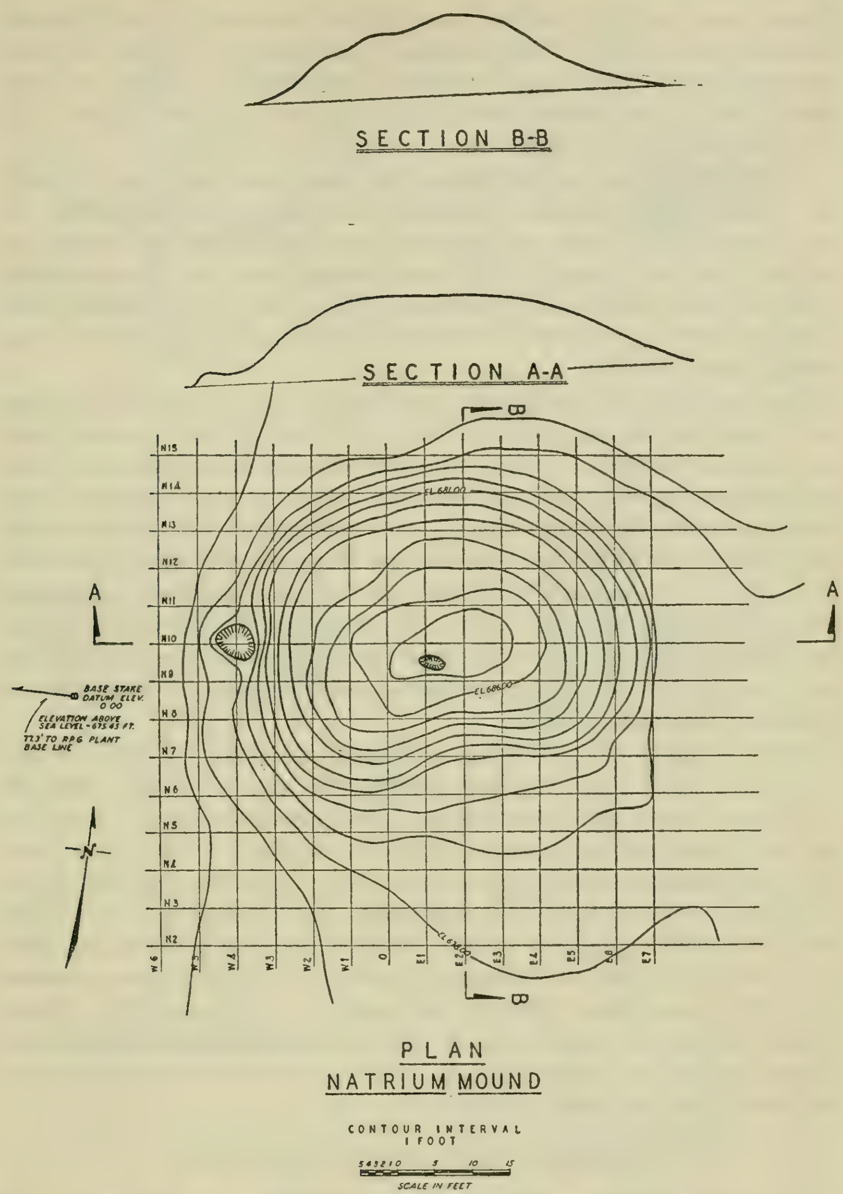
SECTION B-B
SECTION A-A
A
A
B
B
N15
N14
N13
N12
N11
N10
N9
N8
N7
N6
N5
N4
N3
N2
W6
W5
W4
W3
W2
W1
0
E1
E2
E3
E4
E5
E6
E7
EL 681.00
EL 686.00
BASE STAKE DATUM ELEV. 0 00
ELEVATION ABOVE SEA LEVEL - 675.45 FT.
723' TO RPG PLANT BASE LINE
N
PLAN
NATRIUM MOUND
CONTOUR INTERVAL 1 FOOT
5 4 3 2 1 0 5 10 15
SCALE IN FEET

FIGURE 14.—Horizontal and vertical plans of Natrium Mound.

Map prepared by Joseph H. Essington.

in diameter. Instead of presenting the classic conical Adena shape in vertical profile, the mound appeared rather slumped. Undoubtedly, it had been at least 4 or 5 feet higher at one time, since the top was flattened and the sides were eroded. There were distinct traces of a shallow moat or ditch around the base of the mound about 6 inches deep and 4 feet wide. The weeds and grass growing in this low place were markedly distinguished by their large size and profusion. There was a small ovate hollow about 3 by 4 feet on top of the mound. It was less than 6 inches deep.

The mound surface and its immediate locale was examined critically for evidence of artifacts, a search which was not too successful. A large single-pitted stone was recovered on the hill slope to the southeast of Natrium Mound. This was the only artifact found nearby. Two sandstone slabs, one measuring 1 foot by 8 by 2 inches, and another 8 by 8 by 1.5 inches were observed on the north side of the mound near the base.

The necessity for completely leveling the mound within the time limit posed a dilemma, viz, how best to excavate with rapidity and yet not lose the record. Since much of the task in mound excavation (approximately 90 percent of the time involved) was concerned with earth removal, this was obviously our major problem. We were concerned mainly with the overburden and the excavated earth or "backfill." Hence, a bulldozer was proposed for the expeditious removal of the bulk of the unwanted earth. Shovels, wheelbarrow, and trowels, and similar light tools were to be used for the more delicate tasks. In this manner, the available manpower was conserved for the strictly necessary hand operations.

As the months of December and January were not the most auspicious times of the year and bad weather was the rule rather than the exception, shelter and some warmth had to be provided. Three canvas tarpaulins, approximately 20 by 20 feet square, were tied on to elevated frameworks of wooden poles cut from nearby tree limbs. This shelter was kept over the work area. It helped to cover the men and the work's progress during rain and snowfalls alike (pl. 24*e*). A fire was kept close to the area of operations, since the temperatures frequently went below freezing, and down to 14° F. one day. Not a single working day was lost. It was necessary to keep the dig open 3 days over the estimated time for final completion, but this required only one or two regular workmen.

PROGRESS OF THE MOUND EXCAVATION

The progress of the mound excavation during the 23 days spent at Natrium is described below. References are made to one plate of photographs (pl. 24), six progress diagrams (fig. 15), and two detailed vertical cross sections (figs. 16 and 17) which convey an idea of the work involved, perhaps more vividly than written description. The bulldozer which facilitated the mound excavation and dug a test trench east of the mound proper, was operated for a total of 6 hours. De-

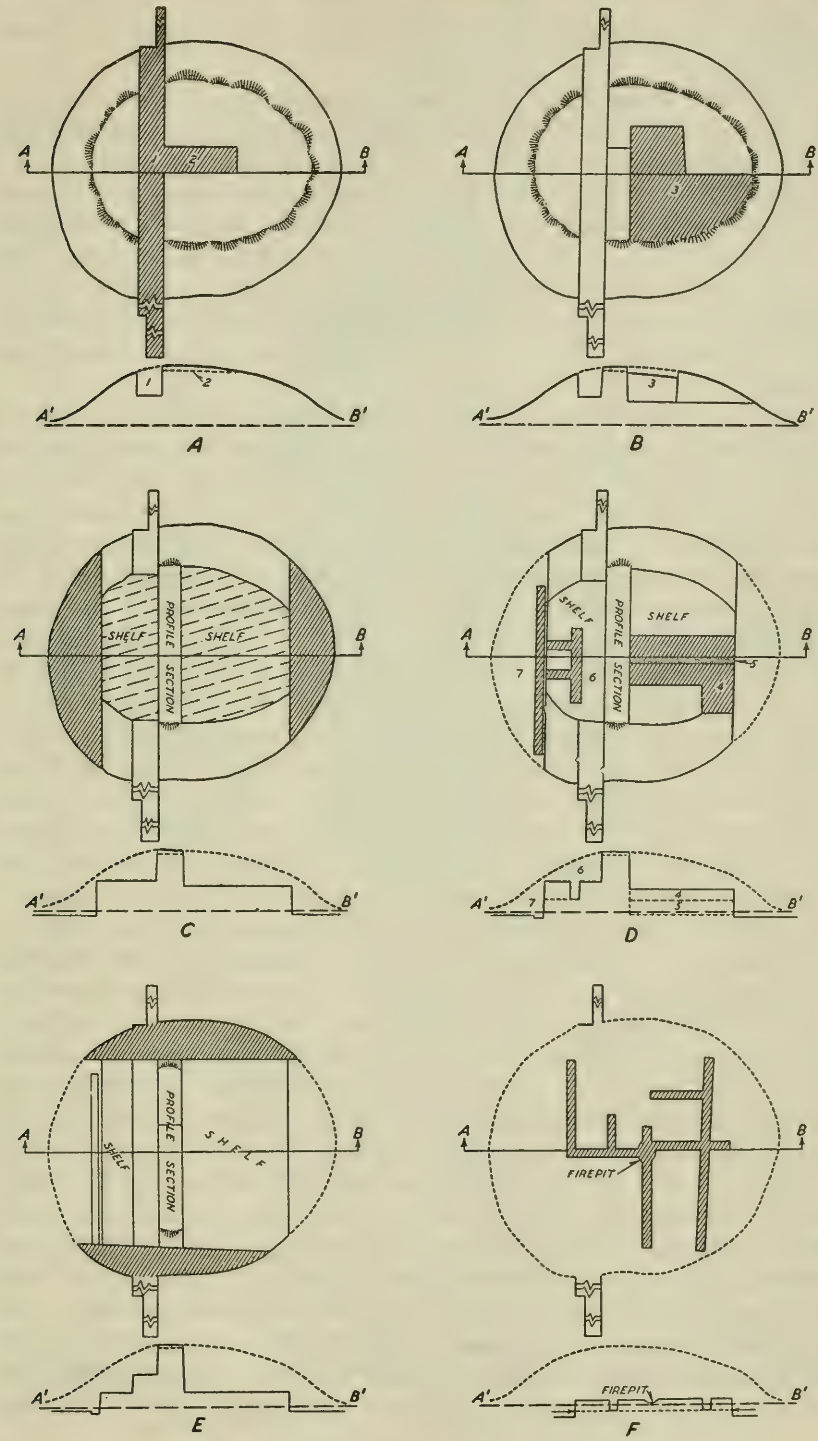
A
B
1
2
A'
B'
A
3
B
SHELF
PROFILE
SECTION
C
SHELF
PROFILE
SECTION
4
5
6
7
D
SHELF
PROFILE
SECTION
E
FIREPIT
F

FIGURE 15.—Six stages in the mound excavation.

scriptions of the various features (fire beds, burials, etc.) are given elsewhere.

The photographic record of the excavations is good. One hundred and sixteen 9-by-12-cm. black-and-white negatives were made of all stages of the operations from start to finish. In addition, eight photographs (2¼ by 2¼ inches) were taken with another camera. To preserve some of the color features of the operations, 57 exposures of 35-mm. Kodachrome were made by the writer. Delf Norona, Jr., took 400 feet of 16-mm. color film in his motion-picture camera and 40 Kodachromes (35-mm.) in his still camera. The Pittsburgh Plate Glass Co.'s photographer took several views of the site and of the excavation progress.

After the mound had been cleared of trees and bushes (pl. 24*a*) a grid system of 5-foot squares was superimposed on the mound and it was staked (fig. 14). The lines ran approximately N-S and E-W. A center line (ordinate), running to the west of the mound center, was established as "0" with respect to east and west. Another center line (abscissa), well to the south of the mound, was established as "0" with respect to north and south. All the stakes were marked. In order to keep directional notations correct, the abbreviations for east and west (E, W) and north and south (N, S) were used. The stakes were reset on the grid as the excavations progressed down to the mound base. A 0.0-foot datum elevation point was established well to the west of the mound. This datum point was tied in to the base line of the Pittsburgh Plate Glass Co. All elevation measurements during the course of excavation were made from the datum point with a Locke hand level and a Philadelphia rod. The hand level was found to be entirely satisfactory for the many readings taken during the work.

In order to ascertain the character of the mound and its contents, a test trench No. 1 (total length 125 feet) was started well out (45 feet) from the mound proper on the south side and carried forward on line E–0, W–0 (pl. 24*b*; fig. 15*A*). This trench was carried to a width of 2.5 feet from stake S4–0 to stake N5–0 (the latter close to the mound base) where the trench width was increased to 5 feet. A deep filled-in cut encountered in the southerly part of the approach trench between stakes N1–0 and S4–0 posed an interesting problem (fig. 16, insert). This cut, 20 feet wide at the top, tapered downward at a rather steep angle. We were forced to discontinue this section of the test, as the loose, sandy soil threatened to cave in after a depth of 4 feet had been reached. One of several shovel tests extending 6 feet farther down (making a total vertical depth of 10 feet) failed to strike bottom. The disturbed soil apparently continued downward. The answer to this perplexing problem was happily elucidated when one of the plant engineers reported that we had cut across the excavation of a chemical

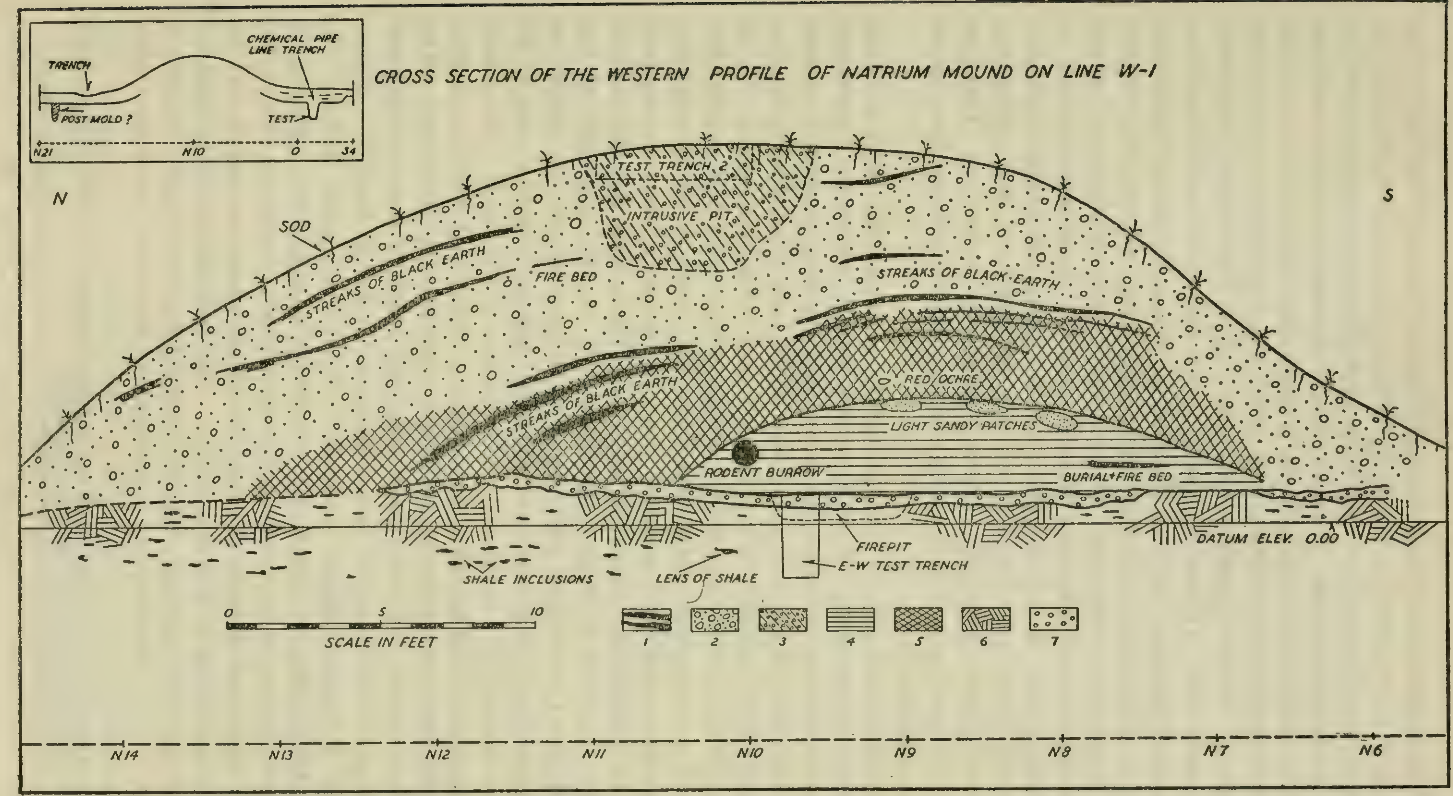
CROSS SECTION OF THE WESTERN PROFILE OF NATRIUM MOUND ON LINE W-1
TRENCH
CHEMICAL PIPE LINE TRENCH
POST MOLD ?
TEST
N21
N10
0
34
N
S
SOD
TEST TRENCH 2
INTRUSIVE PIT
STREAKS OF BLACK EARTH
FIRE BED
STREAKS OF BLACK EARTH
STREAKS OF BLACK EARTH
RED OCHRE
LIGHT SANDY PATCHES
RODENT BURROW
BURIAL+FIRE BED
FIREPIT
DATUM ELEV. 0.00
E-W TEST TRENCH
SHALE INCLUSIONS
LENS OF SHALE
0
5
10
SCALE IN FEET
1
2
3
4
5
6
7
N14
N13
N12
N11
N10
N9
N8
N7
N6

FIGURE 16.—Cross section of the western profile of Natrium Mound on line W–1. Explanation of numbered symbols: *1*, Linear streaks of black earth stains. *2*, Earthy gravel. *3*, Mixture of light-colored gravelly soil. *4*, Dark mixed earth. *5*, Streaked earthy gravel mixed with charcoal. *6*, Sterile gravelly subsoil. *7*, Coarse yellow sandy loam (sterile).

pipeline, 12 inches in diameter, which angled through the field at this point from a brine well to the plant, cutting close to the mound (fig. 13). It was reported that this excavation reached a depth of 15 feet and had to be made rather wide, or about 15 feet, because of the loose shifting sands. This problem solved, the test trench was continued over the top of the mound down to the other side (fig. 16); there the trench was brought to 20 feet beyond the mound base. The digging progressed in 6-inch levels. It was originally hoped that profiles of the shallow ditch could be made on both the north and south sides of the mound, but the circumstances of the chemical pipeline obliterated traces of the ditch on the south side. Consequently, only one disturbed profile of this feature was obtained (fig. 16, insert). A dark earth stain resembling a post mold,[4] 18 inches in diameter and extending 45 inches below the plow line, was found north of the ditch. No explanation could be offered, other than that it appeared to be old. This post mold, if it was such, was the only one encountered during the course of the exploration.

The writer had a predetermined course of action regarding the excavation of the mound. It was deemed best to cut away the western section of the tumulus first, in order that a good photographic record might be had of the initial profile. The best light during the day seemed to be from the west and southwest. The test trench (No. 1) was cut to the west of center avoiding both the intrusive excavation marked by a slump in the middle and saving what possible material of importance might be found in the center for later. It was suspected that, as with most mounds of this type, the center was the locus of importance. While the work progressed on the approach of test trench No. 1, a shallow exploratory E-W test trench (No. 2) 20 feet long and 5 feet wide was carried to a depth of 1 foot on top of the mound and at right angles to the larger trench (fig. 15*A*). An area of dark burned gravel appeared in the center of this E-W trench and some charcoal was found associated with a fragment of worked chert. This evidence was traced to its source, a dark patch of burned earth and odd fragments of charcoal covering about 1.5 feet in diameter, approximately 3 inches thick at a depth of 1 foot in square N10–0.[5] No habitation evidence, specifically post holes, appeared in trench No. 2. In order to keep a N-S profile intact for reference purposes, trench No. 2 was discontinued after this exploratory measure was taken and the main trench, No. 1, was continued. The soil was removed from the mound in a series of steps, working upward from the base of the mound on both sides. Two burned beef bones cut by a metal saw were found in square N12W1 at a depth of 6 inches. These were among the first artifacts of man recovered. The items were obviously much too recent for archeological consideration, although aboriginal material data was found only shortly thereafter. The test trench was carried to an initial depth of 6 feet below the mound summit and the base of the trench was leveled between stakes N7 and N14. The main soil constituent of the mound to this level was found to be a loose gravelly, sandy soil with an occasional fragment of charcoal. The humus layer, or surface sod, was between 1 and 2 inches thick. Tree roots extended below this depth making a kind of subsurface network. Centering on the mound top was an intrusive excavation which had been refilled, making a distinct outline in the vertical cross section (fig. 16). This excavation was 4 feet deep and approximately 7 feet across the top, tapering downward to a width of 3 feet. The hollow, noted previously on page 322, marked this feature on the surface (fig. 14). It was not immediately ascertained how long the excavation was, but it appeared to be in the neighborhood of 10 feet as the later tests showed. This intrusive hole cut across two bands, about 1 inch thick, of red stains spotted with charcoal, which extended across the upper levels of the mound. These streaks followed the contour of the mound surface. It is presumed that they represent successive additions of earth heaped on the mound. A series of thicker bands, averaging 1.5 inches in thickness, or burned earth and charcoal, were found at a lower depth (fig. 16). They seemed to be part of a smaller included mound. The loose gravelly soil of the upper portion of the mound did not demarcate any stratigraphic evidence other than the lenses of fire-burned earth and streaks of black dirt. Evidence of stratigraphy and indications of individual earth loads were found better preserved closer to the base of the mound, where the soil characteristics were more favorable for these details.

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[4] This may be one of the test drill holes made by a contractor in this area, according to a letter dated May 30, 1945, sent by Delf Norona to the Smithsonian Institution.

[5] The individual square in the grid system is designated by the symbol of the southwest corner stake.

The next step planned was to cut away the gravelly overburden on either side of the tumulus center, leaving a 5-foot-wide reference profile or "key" approximately in the middle of the mound. An L-shaped cut (fig. 15*B*, *3*), an exploratory measure, was excavated to a depth of 6 feet from the top and to the right of the center of the mound. The profile cross section (fig. 17) drawn on line A–B within the limits of this excavation illustrates the lensing and soil stratigraphy. A section of another large intrusive pit, filled with light gravelly soil, cut through the layered lenses of black dirt. It disturbed the southern periphery of a burial, feature 32, which was unearthed later. There was a ½-inch coating of light-colored clay at the bottom of the pit. There was no connection observed between this intrusive excavation and the one mentioned previously, hence it is presumed that these were two

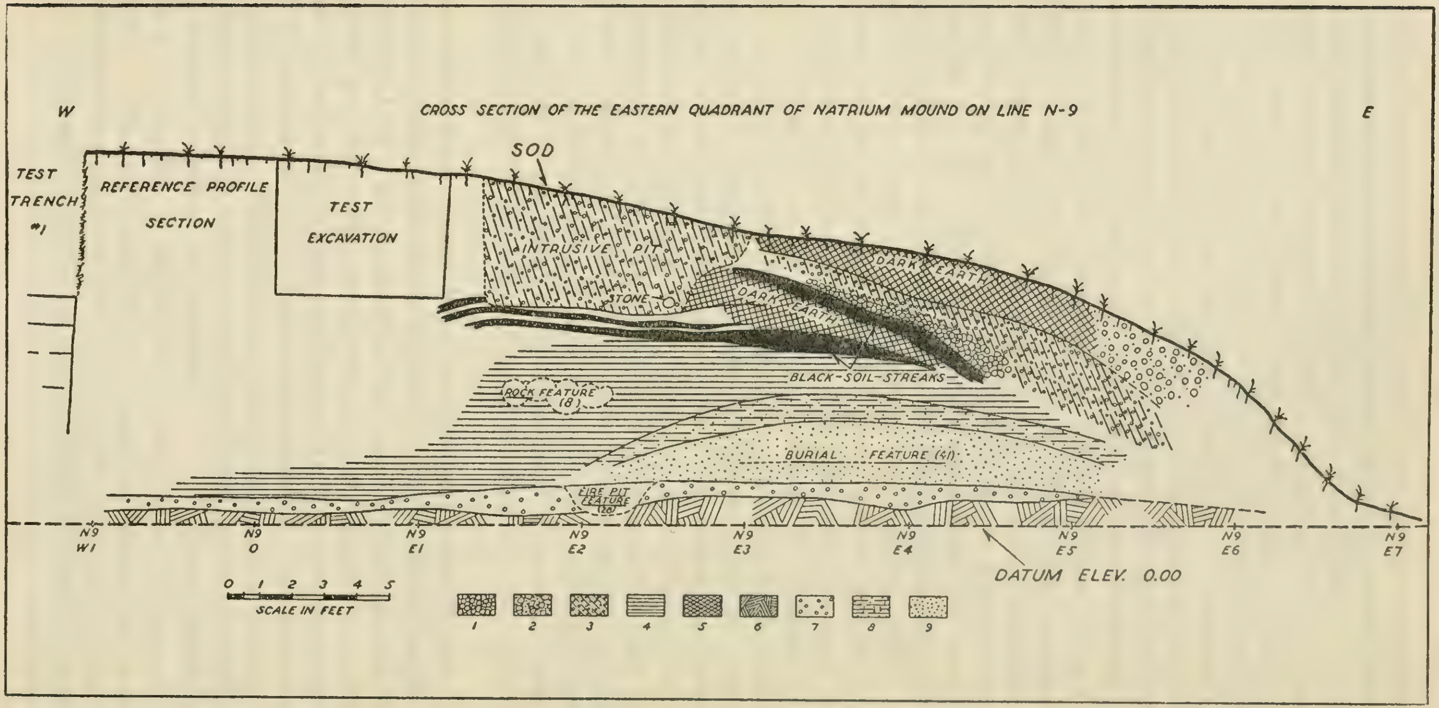
W
CROSS SECTION OF THE EASTERN QUADRANT OF NATRIUM MOUND ON LINE N-9
E
SOD
TEST TRENCH #1
REFERENCE PROFILE SECTION
TEST EXCAVATION
INTRUSIVE PIT
STONE
DARK EARTH
DARK EARTH
BLACK-SOIL-STREAKS
ROCK FEATURE (8)
BURIAL FEATURE (41)
FIRE PIT FEATURE (38)
N9 W1
N9 0
N9 E1
N9 E2
N9 E3
N9 E4
N9 E5
N9 E6
N9 E7
DATUM ELEV. 0.00
0 1 2 3 4 5
SCALE IN FEET
1
2
3
4
5
6
7
8
9

Figure 17.—Cross section of the eastern quadrant of Natrium Mound on line N–9. Explanation of numbered symbols: *1*, Clean gravelly soil and large pebbles. *2*, Earthy gravel. *3*, Mixture of light-colored gravelly soil. *4*, Mixture of black earth. *5*, Concentrated zone of dark earth. *6*, Sterile gravelly subsoil. *7*, Coarse yellow sandy loam (sterile). *8*, Cap of mixed gravelly loam. *9*, Loose gray soil.

separate holes dug into the top of the mound. The burial, which had apparently just escaped detection, was the first one we encountered, auguring well for the exploration.

Tracing the soils beneath the humus line on the east side of the mound there was found a 1.5-foot deposit of dark soil which had the usual amount of roots and similar vegetal matter. It is likely that this was some of the dirt thrown out of the large intrusive pit. The soil in this level exhibited more gravelly characteristics toward the outer or eastern periphery of the cut. The pebbles were undoubtedly the products of natural mechanical segregation resulting from the enlargement of the mound, the heavier materials seeking their level at the outer and lower borders. This may be likened to a talus slope deposition. Underlying the dark soil layer was a lighter-colored deposit of gravelly soil about 1 foot thick, with an especially heavy base of pebbles about 5 inches thick concentrated on the bottom. It lay more toward the periphery of the mound. This also was probably a product of natural mechanical soil segregation. Similarly, following the mound contour, but on a steeper bedding plane, was a linear streak of black dirt averaging about 3 inches in thickness. This, in turn, lay over additional alternating lenses of light and dark soil. The latter soils, however, were more horizontally bedded. In the course the excavation artifacts and inclusive features—such as fire beds, burials, etc.—were examined, charted, and excavated as they were encountered.

After exploratory cuts were made in the remaining standing portions of the top of the tumulus on either side of the key, it was decided to summon the bulldozer for the first time. It was determined to make equal cuts into the east and west sides of the mound at base level, paralleling the central reference profile or key. The latter's axis was oriented north and south in the system of grid squares between lines W–1 and E–0. In addition, in view of the time element involved, it was thought best to plane both sides of the key down to the explored depth. Flags were set at the sides of the mound marking the inner limits of the cuts to be made by the bulldozer. The bulldozer operator, an expert at his job, was briefed about the requirements. Thus instructed, he completed his phase of the operations (fig. 15*C*).

First, the bulldozer scooped up the loose dirt on both sides of the key, planing down the explored overburden to the excavation level. Then he made cuts extending to approximately 2 feet below datum level outside the platform area, sufficiently below any occupation levels encountered. The dirt was heaped at both ends (north and south) of the mound far enough away so that it did not impede further progress. The workmen examined the exposed profile sections after the bulldozer operator had cut away each additional face. The blade of the bulldozer was an effective side-slicing instrument as well as a horizontal scraper. By exercising good control, vertical slicing was kept to widths of about 1 foot, although it was possible to slice as narrow as 6 inches when necessary. Used as a scraper, it was an easy matter for the bulldozer to skin off 8-inch horizontal levels, one at a time, backing up for each cut.

The result was a key standing on a platform 37½ feet long (east and west). The platform was 6 feet above datum level on the west side of the key and 4.5 feet above datum level on the east side of the key. This done, the stakes of the superimposing grid were reset on the platform, and conventional excavation with wheelbarrow, shovels, and smaller hand tools began anew.

In order to uncover the central area, excavation was begun in a broad, inverted L-shape on the eastern side of the key (fig. 15*D*, *4*). This excavation was carried down to an initial depth of 2.5 feet from the surface of the platform or 2.5 feet above datum. It was discovered that the greatest amount of archeological material, including skeletal remains, etc., came from approximately this elevation. This held true for the rest of the mound as the excavation progressed. Laminated light-colored soil deposits 2 to 3 feet in diameter and about 6 inches thick were noted in the lower deposits. These could have represented individual loads of earth. Large lenses of ash-gray soil were also found. Another test trench (fig. 15*D*, *5*) 2 feet wide was carried east to west through the excavation in the eastern side of the mound at right angles to the standing profile. This trench reached a depth of 3 inches below datum level into virgin soil.

Since the weather was becoming increasingly unfavorable, a framework of poles covered with canvas tarpaulins was erected in order to permit excavation in the central rectangle. A large fire was kept burning each day in the shallow pit which had been dug to the east of the mound.

The mound shelf to the west side of the key was tested with a system of three interlocking test trenches in the shape of the Greek letter π, (pl. 24*c*; fig. 15*D*, *6*). These trenches, about 1.5 to 2 feet wide, were carried to a depth of 4 feet from the platform surface. Lensed pockets of earth appeared in this western mound section. Another trench (fig. 15*D*, *7*), 33 feet long and 1.5 feet wide, was cut at the base of the western profile section to a depth of 2 feet below the surface which had been cut away by the bulldozer. This trench did not reveal any additional data.

The portion east of the key was taken down with shovel and wheelbarrow. The portion to the west of the key was sliced away by the bulldozer leaving a two-step platform, the lower of which was 2 feet above the datum plane (pl. 24*d*, fig. 15*E*). The northern and southern sides of the mound were crosscut with the bulldozer and the dirt heap resulting from the hand excavations was removed. Since the key or reference profile threatened to slump, it was decided to remove this also, using hand labor. It had been planned originally to leave the key until last. The roots and root tendrils coupled with the frost were expected to help support the key. However, the gravelly character of the soil plus the rain and an unexpected thaw caused the key to slump. Hence it could not be maintained intact.

An increasing wealth of data was uncovered as the mound base was approached. These data were concentrated in the mound center (fig. 18). Domed concentrations and piles of gray-colored soil were noted near the center also, principally near the base. Areas of sterile yellow clay soil were found at the mound base, indicating a prepared floor (figs. 19*A*, *B*). The gray and yellow soils were undoubtedly part of the preparation for the interment of burials within the mound. These soils are discussed under the heading "Soil samples" in the appendix. There was a streak of black dirt in the north section of the mound which appeared to be of humus origin. This streak was 1.5 feet above the datum elevation. There was another streak of dark earth on the eastern periphery also. These may have marked the original surface which apparently had been largely stripped of the soil cover in the preparation of the mound floor.

A central fire pit (feature 28) occurred in the mound floor extending into the sterile gravel layer below the mound (figs. 16, 17). This feature, judging from related mounds, was evidently the center of importance within Natrium Mound. However, there was a singular lack of material data recovered in comparison with other features in the same mound. A network series of test trenches were systematically dug through the mound base into this sterile soil (fig. 15*F*). No further data were found. The test trenches extended from 1 to 2 feet in depth below the base of the mound proper.

The majority of the mound features were found at an elevation varying between 1 to 2.5 feet above the datum plane (figs. 16, 17) or a little above the base of the mound proper. In the final stage of the excavation, after we were satisfied that no more features were to be found, the bulldozer sliced away the remainder. The final cut was from 2 to 3 feet below the base of the mound (pl. 24*f*).

In the hope of finding village remains, the bulldozer made a test cut 75 feet to the east of the mound (fig. 13). This trench was 116 feet long, 10 feet wide, and 2.5 feet deep. No aboriginal features of any kind were found. The subsoil was a sterile yellow earthy terrace gravel containing stones of various small sizes. Neither the sides of the cut nor the excavation floor area showed anything of interest.

THE MOUND FEATURES

INTRODUCTION

In order to make the feature descriptions more orderly and to facilitate the study, the 51 features were arbitrarily regrouped and renumbered. There were two major classes of features: Those not containing burials or any traces of skeletal material (numbered 1–31), and the second class consisting of the burials (32–51). The latter were represented by one or more osseous fragments.[6] The features of these two groups were arranged in numerical order depending on their elevations from datum, those encountered at higher elevations having the lower feature number. It was subsequently learned that through phosphate analysis, many of the features of the first group, although not containing preserved skeletal matter, also may have represented burials.

The written descriptions were supplemented by scaled diagrams and photographs. The tapes and scales used in the field were marked in feet and decimal parts of feet. The data presented below were necessarily compressed. Through error, no datum elevation was obtained for three small fire beds (Nos. 29–31). The major features are illustrated in figure 18.

An interpretative summary of the mound features is given at the end of the descriptions.

DESCRIPTION

Feature 1.—This was apparently a fire bed identified by a thin, concave lens of reddened and burned earth, 0.25 foot thick, containing a mixture of pebbles and charcoal. It was situated in square N12E1 at an elevation of 6.1 feet from datum. The outline was 1.3 feet in diameter, and circular in shape. No associated artifacts were present.

Feature 2.—A fire bed, identified by burned-appearing red-brown earth and ashes, was encountered in square N9E3 at an elevation of 5.4 feet from datum. This feature was 1.4 feet in diameter by 0.1 foot thick. There was no associated material.

Feature 3.—There were indications of a strong fire by the amount of fire-burned earth which extended for a depth of 2 feet. This fire bed was situated in squares N5W4 and N6W4 at an elevation of 5.4 feet from datum. Associated remains were absent.

Feature 4.—A thin layer of reddish-brown earth containing associated artifacts and red ochre was found in squares N11E2 and N12E2 (pl. 24*g*). This layer, only 0.25 foot thick, measured 5.0 feet in NW-SE direction by 3.0 feet in SW-NE direction. It was encountered at an elevation of 4.9 feet from datum and 5.2 feet from the surface

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[6] Dr. T. Dale Stewart, of the Department of Anthropology (Division of Physical Anthropology), U. S. National Museum, identified the burial remains submitted to him for examination.

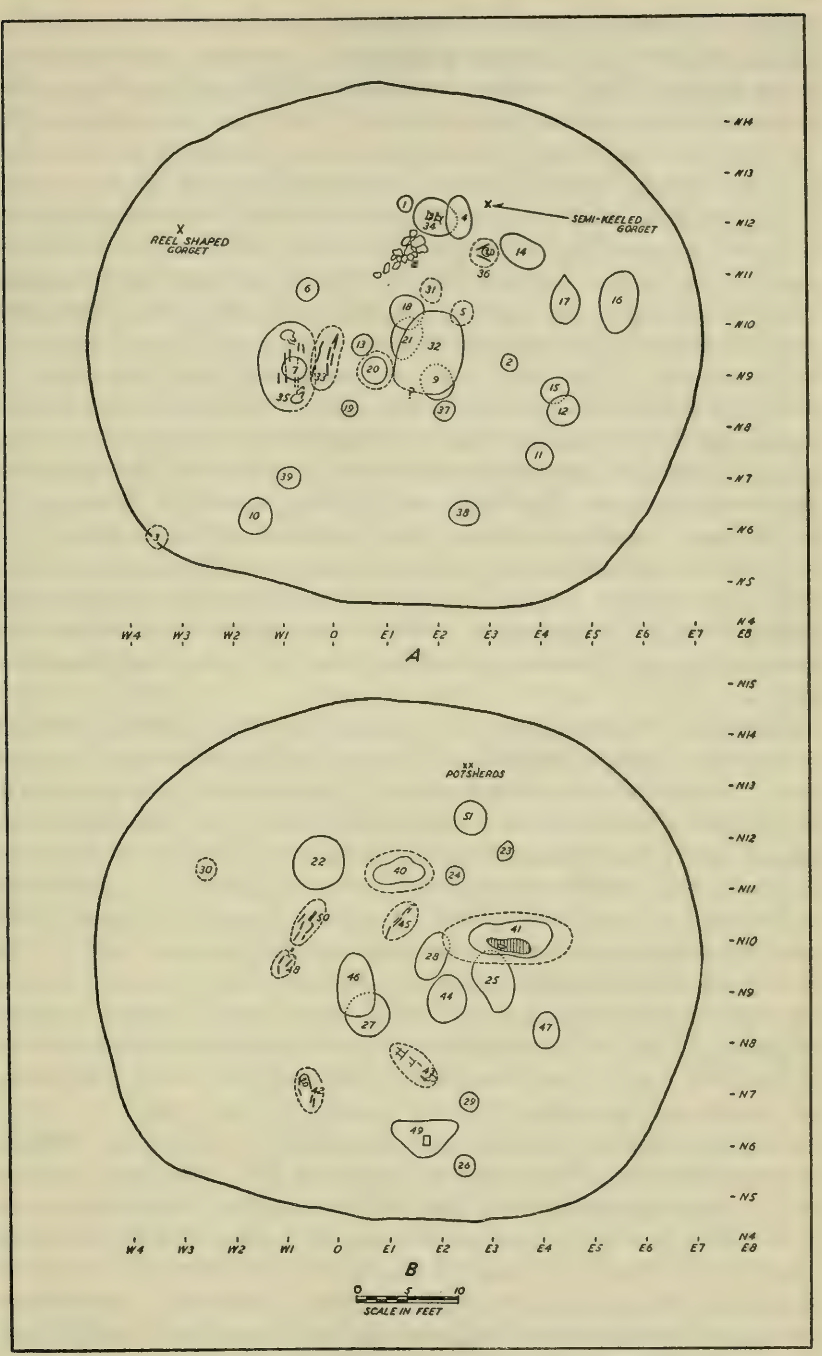
REEL SHAPED GORGET
SEMI-KEELED GORGET
POTSHERDS
N14
N13
N12
N11
N10
N9
N8
N7
N6
N5
N4
N15
W4
W3
W2
W1
0
E1
E2
E3
E4
E5
E6
E7
E8
A
B
0
5
10
SCALE IN FEET

FIGURE 18.—The distribution of the mound features.

of the mound at this point. It contained 13 chert blades or knives, 1 mud concretion, 1 natural ferruginous cup stone, and a quantity of red ochre. These artifacts were undoubtedly arranged with some purpose in view in the manner found. Ten of the chert blades (leaf type) lay close together as in a cache, overlapping one another. They were completely covered by a bed of red ochre, 1 by 0.7 by 0.1 foot in dimension, which had to be scraped off in order to expose the blades. A large stemmed blade occurred in this same red ochre 0.4 foot to the south of the blades. Another stemmed blade associated with a smaller patch of red ochre was exposed 6 inches away from the main cache. A lone stemmed chert blade (pl. 28*r*) was uncovered 2 feet to the north of this group. This blade was not associated with red ochre. A small deposit of the substance was exposed between the group of blades and the stemmed blade. A darker area, perhaps indicating organic substance long since rotted away, was observed on the eastern side of this feature. The dark area, oblong in outline, measured 0.3 by 1.6 feet. Black mixed earth was found below this feature.

Feature 5.—A small string of seven copper beads, associated with some dark fibrous organic matter resembling bark, was found in square N10E2. This feature, 4.6 feet from datum and 7.0 feet from the mound surface, was uncovered in the course of removing the mound fill.

Feature 6.—Charcoal and some discolored earth marking a fire bed were found in square N10W1. The fire bed lay 4.6 feet above datum and 7.0 feet below the mound surface. It was circular in outline with a diameter of 2.5 feet and 0.1 foot in thickness. The charcoal and discolored earth were separated in two thin lenses. A hematite celt (pl. 26*z*) was found 2.0 feet to the southwest of this feature in dark earth.

Feature 7.—A fire bed marked by reddish-brown earth and a small quantity of associated red ochre was found in square N9W1. This feature lay 4.6 feet above datum and 7.0 feet from the mound surface. Directly beneath it was a group burial, feature 35. Feature 7 was approximately 2.5 feet in diameter and circular in outline with a thickness of about 0.1 foot. Associated with it was one pestle-shaped stone and one whetstone, including the small quantity of red ochre.

Feature 8.—A low ovate mound of blackened, cracked, and burned-appearing sandstones were found in squares N11–0, N11E1. Several of the stones appear to have been broken in place. Situated 4.4 feet from datum and 6.5 feet below the mound surface, this feature measured 2.5 by 4.0 feet and was 0.75 foot thick. It was oriented in a N-S direction. No artifacts were directly associated with these stones. The tops of several stones had some reddish-brown matter adhering to them. Two more flat sandstone slabs were found close to the main heap. They lay to the southwest.

Feature 9.—A bed of charcoal in which were included several patches of light-colored earth was discovered in squares N8E1, N8E2, N9E1, N9E2 at an elevation of 4.1 feet from datum. This feature was circular, measuring 3.0 feet in diameter by 0.2 foot thick. Associated artifacts were absent.

Feature 10.—The reddened soil of a circular-shaped fire bed with an included thickness of a mixture of charcoal was found in square N6W2 at an elevation of 4.0 feet above datum. The fire bed was 3.0 feet in diameter and between 0.05 and 0.15 foot thick. No artifacts were found in or near this feature.

Feature 11.—A fire bed was found in squares N7E3 and N7E4 at an elevation of 4.0 feet from datum and 1.5 feet below the mound surface. This fire bed, marked by a streak of orange-red earth, lay above a layer of black earth unassociated with any other data. It was circular in outline with a diameter of 2.5 feet and a thickness of 0.05 foot.

Feature 12.—A circular-shaped lens of reddish-orange burned earth, which was associated with decomposed organic remains found to the northwest of this feature, was 3.5 feet in diameter and 0.05 foot thick. Three chert blades were uncovered above the bed. A quantity of red ochre was found on the eastern periphery of feature 12 (square N8E4).

Feature 13.—A fire bed was situated in square N9–0 at an elevation of 3.8 feet from datum. It was circular in outline, 2.0 feet in diameter and 0.5 foot in thickness. The fire bed was composed of charcoal and ashes. Charcoal, which lay longitudinally across the top of this feature, was especially abundant. Artifacts were lacking, but there were some stones within the confines of the lens. The earth immediately above it was discolored a lighter hue for several inches.

Feature 14.—The reddened and burned earth of a fire bed was found overlapping the boundary of squares N11E3, N11E4 at an elevation of 3.6 feet from datum. This thin-lensed feature (0.05 foot thick) was ovate in shape. It was 3.0 feet in width (N-S) and 4.0 feet in length (E-W). Associated material included a small quantity of red ochre recovered on the southern periphery of the bed and a chert flake on the eastern border. A projectile point was found nearby to the east of the feature.

Feature 15.—An orange-colored lens of earth containing a small amount of red ochre and a small string of four copper beads was discovered in square N8E4 at an elevation of 3.5 feet from datum. This feature was ovate in outline with a maximum diameter of 2.0 feet. It was 0.05 foot thick at its maximum point.

Feature 16.—Six copper beads accompanying a fragment of preserved string were uncovered during the examination of a fairly large ovate feature in square N10E5. This feature, found at an elevation of 3.0 feet from datum, measured 7.0 feet (N-S) by 4.0 feet (E-W). It was shallowly concave in cross section with a maximum thickness of 0.1 foot. There was a layer of gray soil beneath the red earth of this feature. Light-colored gravel occurred above it.

Feature 17.—Three thicknesses of orange-red colored lenses of earth were found in square N10E4 at an elevation 3.0 feet from datum. The over-all thickness was 0.25 foot. The topmost stratum measured 4.0 feet (N-S) by 2.0 feet (E-W). The lower layers, oval in outline, were each 1.5 by 0.5 feet. An intermediate layer of dark earth separated them. Seven heavily patinated chert blades were found associated with the top layer lying immediately to the north side of its boundary. Four were grouped together, while the others were spaced about 1.5 feet apart.

Feature 18.—A heavy black deposit of earth mixed with traces of charcoal and burned earth was found in square N10E1 at an elevation of 3.0 feet from datum. It was circular in outline with a diameter of 3.0 feet and a thickness of 0.075 foot. A chert blade occurred in the burned earth. This feature lay immediately above part of feature 21.

Feature 19.—A charcoal bed containing four fire-burned and fire-cracked stones was uncovered in square N8–0 at an elevation of 2.9 feet from datum. This bed, 1.0 foot in diameter, lay in an area of light-colored mixed soil.

Feature 20.—A reddish-brown colored lens, capped by a layer of brown soil and surrounded by loose gray soil, was excavated in square N9–0. This feature, lying at an elevation of 2.6 feet from datum, was 3.0 feet in diameter and 0.05 foot thick. A number of artifacts, including 5 chert blades, 2 celts,[7] 1 hematite hemisphere (pl. 27*l*), 1 broken projectile point, 1 chert scraper, 1 round stone ball (pl. 26*f*), and 1 piece of mussel shell were found in it.

Feature 21.—A compacted lens of red-brown earth 0.05 foot thick associated with a large number of artifacts, principally blades, was uncovered in squares N9E1 and N10E1 at an elevation of 2.6 feet from datum. This feature was ovate in outline, measuring 5.0 feet (N-S) by 2.5 feet (E-W). The artifacts recovered include 109 chert blades, 1 fragment of hematite celt, 1 chert drill, 1 fragmentary chert drill, 1 excavated steatite boat stone, 1 projectile point, 1 fragmentary bear canine tooth, and 1 fragmentary chert artifact. A small quantity of red ochre was also recovered in 2 patches. The artifacts were found in layered cluster concentrations indicating purposeful arrangement (pl. 24*i*). The boatstone (pl. 25 *i*, *j*), situated on the top of the largest group of blades, had its hollow side downward. Some loose dirt and a few small pebbles, apparently sifted in from the outside, were found therein. The blades seemed to have been arranged in no definite orientation and were stuck in the lens at all angles. The fragmentary hematite celt (pl. 26*a′*) was found with the bit end pointing downward. All the artifacts, particularly blades, show evidence of intense heating, accounting for some of the blade fractures. Some of the latter objects (pl. 28 *j*, *k*, *n*) are encrusted with as much as 1 mm. thickness of black carbonized organic matter which may have been part of a covering or associated perishable goods. A layer of compacted dark earth was found beneath this feature. A lens of loose gray soil overlapped from the eastern side of the mound.

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[7] The base of one of the celts (pl. 26*g*) appears to be discolored by graphite.

Feature 22.—A group of artifacts was uncovered in this feature which was situated in square N11W1 at an elevation of 2.1 feet from datum. It was 4.0 feet in diameter and 0.45 foot thick. There were two groups of 15 chert blades, some evidence of copper beads, 2 patches of yellow ochre, 2 deposits of red ochre, and 2 small patches of whitish material.

Feature 23.—An oblong-shaped fire bed of orange-red earth was uncovered in square N11E3 at an elevation of 2.3 feet from datum. It was 2.0 feet in diameter and measured 0.07 foot at the thickest part. There were no associated artifacts.

Feature 24.—A fire bed, 1.5 feet in diameter and 0.05 foot thick, was encountered in square N11E2 at an elevation of 2.0 feet from datum. Associated remains were absent.

Feature 25.—An ovate-shaped bed of orange-red earth with a thin covering of white matter was found occupying portions of squares N8E2, N8E3, N9E2, and N9E3 at an elevation of 1.7 feet from datum. This lens, measuring 6.0 feet (N-S) by 3.7 feet (E-W), was 0.05 foot thick. Associated with this feature were 1 fragmentary chert blade, 2 celts, 1 slate pendant gorget (pl. 26*b*), 4 hematite hemispheres, 2 faceted hematite stones, 8 chert projectile points, 1 flaked reject, 3 small concentrations of red ochre and 2 traces of red ochre, a deposit of some yellowish-brown matter, and a small deposit of black organic matter. Seven of the projectile points were found lying close to the gorget. Next to the gorget was also some dark charred organic substance. The artifacts were crusted with a thin coating of the white matter mentioned above. The hematite hemispheres were grouped together, the convex sides upward. One of the flints lay in a deposit of red ochre.

Feature 26.—A lens of reddish-brown earth 2.0 feet in diameter was found in square N5E2 at an elevation of 1.5 feet from datum. Some red ochre was all that was to be noted within this feature.

Feature 27.—A concentration of charcoal and ashes was uncovered partially below feature 46, a burial, in square N8-0 at an elevation of 1.2 feet from datum. This feature was circular in outline measuring 4.0 feet in diameter and 0.45 foot thick. Feature 27, lying 0.5 foot below the burial, was shot through with indications of a strong fire.

This evidence may have been directly associated with the overlying burial.

Feature 28.—This was a pit at the approximate center of the mound intruding into the yellow basal soil stratum in squares N9E1, N9E2, N10E1, N10E2. The top of the pit was 1.0 foot from datum and 10.5 feet from the surface of the mound at this point. This feature was 0.9 foot deep, basin-shaped in cross section, and 4.5 feet (N-S) long by 2.9 feet (E-W) wide. It was oval-shaped in horizontal plan section. The pit was filled with dark earth in which were mixed some loose pebbles. There was a lens of loose gray soil over it and a low heap of the same soil around the pit mouth. The sides of the pit interior were lined with orange-colored soil and some white matter. One stemmed projectile point and a small quantity of red ochre were found in this orange soil near the northern periphery. There was a thickness (approximately 0.04 foot) of orange-red earth in which were included several fragments of charcoal situated near the base of the pit. At the bottom there was a hard layer of reddish-brown earth 0.05 foot thick, while underneath the pit the earth appeared to have been burned for another 0.05 foot. There was no evidence of log tombing or indications of any other kind of structural work associated with this feature.

Feature 29.—A small fire bed, 2.0 feet in diameter, was uncovered in square N6E2 by the bulldozer. Through error, no datum elevation was taken on this feature. It was composed of a reddish-brown earth lens 0.1 foot thick which included a few charcoal fragments. There were no associated artifacts.

Feature 30.—A small lens of reddish-brown earth capped by some loose gray earth was encountered in square N11W3 while bulldozing the loose earth fill aside. No measurements were obtained. There were no associated artifacts.

Feature 31.—A small deposit of charcoal and burned gravel was uncovered in square N9-0. There were no associated artifacts. Unfortunately, measurements were not taken of this feature.

Feature 32.—Cranial fragments were encountered near the bottom of a recent intrusive pit in square N9E2 at an elevation of 8.4 feet from datum and 3.5 feet from the mound surface. The southern edge of feature 32 had been disturbed by the excavation which apparently missed this burial (fig. 17). This feature was oval in outline, 7.5 feet wide (E-W) by 9.0 feet long (N-S). Its determinable depth was 0.2 foot. The bones were found in association with organic discolorations, resembling bark, 0.3 foot above the feature bottom. Two projectile points, 5 blades, a string of 33 copper beads, and 1 whetstone (pl. 27*g*) were found lying close together on a bed of orange-red earth near the human remains. There was much evidence of intense heat and burning. The bottom was lined with a thin layer of light-colored clay. The skeletal remains consist of fragments of a skull vault of medium thickness and a few permanent teeth. The skull-vault fragments (parietal and frontal) were found lying one above the other. The edges were somewhat blackened. From the condition of the sutures and the wear of the teeth, this individual was at least middle-aged. Sex could not be determined.

Feature 33.—A burial was uncovered in squares N9W1, N9–0 at an elevation of 5.0 feet from datum. The remains consisted of the bones of two extended postcranial skeletons, both very poorly preserved. These bones were lying on a bed of dark earth and charcoal accompanied by gray ashes and some reddened earth. There were no associated artifacts. The burials appeared to have been articulated. Both were extended in a north-south direction, but headed in opposite directions. The preservation was so poor that only the long bones and a few of the foot bones could be identified.

Feature 34.—A fairly important burial occupied portions of squares N11E1, N11E2, N12E1, N12E2 at an elevation of 4.4 feet from datum. The feature was ovate in outline, about 4.0 feet in diameter with a thickness of 0.5 foot. Among the large number of funerary materials found with the burial are included 2 chert blades and 1 fragmentary blade, 1 copper reel gorget and associated preserved textile remains (pl. 25 *a*, *b*), coiled strings of 291 copper beads, some chert chips and flakes, 2 projectile points and 1 fragmentary projectile point, 1 chert reject, and a quantity of red ochre. The burial, accompanied by the enumerated goods, lay on a reddish layer of apparently fire-burned earth covered with a small capping mound of ash-gray soil 3.0 feet high. There appeared to have been the remains of a bark covering over the beads and associated copper gorget. The crown of a deciduous canine tooth adhering to a piece of alveolar bone preserved by copper salts was all that was recovered of the human material.

The burial furniture was undoubtedly carefully arranged as found in situ (pl. 24*h*). There was no evidence of tomb construction of any kind.

The artifacts may be divided into three groups of associated objects. Group 1 consists of the copper gorget and associated material; group 2 consists of a string of large copper beads; group 3 consists of a spread-eagle arrangement of at least three different-sized copper beads with other accompanying objects.

Beneath the gorget in group 1 was a piece of textile preserved by the copper salts (pl. 25 *a*, *b*). To the right of the gorget was a crudely worked black chert specimen. A patch of white powdery material, 2 inches in diameter, was found close to the latter. To the left and immediately adjacent to the gorget was a layer of orange-red colored earth.

Group 2 consisted of a string of 19 large copper beads which had been coiled laterally upon itself. A small rectangularly shaped piece of common coal lay in the center of this group.

Group 3 represents the only figurelike arrangement of beads found in the mound. What may have represented the body was outlined by two parallel strings of copper beads converging toward the top. A wing-spread arrangement of beads closed the figure at the top and a long string of beads whose ends extended several inches beyond the figure, closed the bottom. A patch of white material was found surmounting the figure at the head. Within the center of the enclosed frame of beads was recovered a dark stemmed chert projectile point and the pointed end of a gray chert projectile point. A light-colored stemmed projectile point of chert occurred within the right wing of this figure. A large deposit of red ochre about 0.5 to 0.7 foot in diameter was found in direct association with this group, lying under and next to the right wing. Some yellow-ochre stains were also noted adjacent to the red ochre.

The deposit of white material near the chert specimen in group 1 gave a low test for phosphate, hence it was certainly not cremated bone remains. The other deposit of white material at the head of the figure in group 3 was very high in phosphate content, therefore it probably represented cremation remains or bone ash.

Feature 35.—Extending in squares N8W1, N8W2, N9W1, N9W2 was found a burial feature of large dimensions. It lay at an elevation of 4.6 feet from datum and 7.0 feet from the mound surface. The burial shape was ovate measuring 10.0 feet (N-S) by 8.0 feet (E-W) and was 0.4 feet thick. The skeletal material recovered was that of two poorly preserved adult reburials (?) lying on the characteristic lens of reddish-brown earth. The burials were extended side by side, heading in opposite directions, one to the north (facing east); the other to the south (facing position undetermined). The bones rested on decayed organic matter which in turn overlay the reddened earth patch mentioned. Recognizable bone fragments include right and left tali, sacrum, left scapula, right tympanic bone, lower jaw, and the following permanent teeth: Left upper Pm1, Pm2, M1, M2, M3; upper right M3; left lower Pm2, M1 (?), M2 (?). The teeth are moderately worn and hence adult. These came from the north-heading burial. The bulk of the artifacts recovered lay above the thorax of the burial headed north.

Some small fragments of charcoal were found near the center of the burials. A patch of clay about 8 inches in diameter enclosing a chert blade was found over the lower midsection of the north-headed burial. The skull of this burial lay on a bed of charcoals and red earth. A whetstone with an associated faceted hematite stone (pl. 27*f*) occurred at its jaw beneath three other faceted hematite stones and a linearly inscribed or cut sandstone. Directly adjacent to it was a drill point (pl. 28*o*′) and some small chert flakes lying in a spongy mass of reddish-brown earth. A fragment of worked bone and a hematite celt were also closely associated with the lower part of the head.

Two small patches of red ochre were observed on either side of this feature.

The total assemblage of specimens from this group includes 1 chert blade (pl. 28*p*), 2 fragmentary chert blades, 1 piece of worked bone, 1 celt, 1 chert drill, 15 chert flakes, 4 faceted hematite stones (1 in situ lying on a grooved silt stone), 1 fragmentary projectile point, 1 chert reject, 1 piece of mussel shell, 1 grooved so-called whetstone of silt stone, and 1 sandstone abrading stone (pl. 27*a*).

Feature 36.—A unique reburial was unearthed in squares N11E2, N11E3 at an elevation of 4.1 feet from datum, occupying an oval area of about 3.5 feet in maximum diameter. The remains consisted of some crushed cranial fragments lying between 2 long bones. These bones, poorly preserved, occupied an area of 1.0 by 2.1 feet. The teeth showed moderate wear and the skull showed the beginning of endocranial suture closing, hence this was an adult. From the skull's thickness, it was judged to be a male. The long bones lay close to either side of the cranial remains converging to the rear. There was a layer of black dirt around the bones which seemed to have been set in a rather shallow pit. The crowns of the five molar teeth recovered (left upper: M1, M2, and M3; right upper: M2, M3), especially those of the right side, were stained black. Associated artifacts were absent.

Feature 37.—Evidence of a cremated burial was unearthed in square N8E2 at an elevation of 2.8 feet from datum. This burial occupied a circular area of 1.0 foot in diameter and was 0.2 foot thick. It consisted of some cremated, or at least burned, bones lying in a little heap on a 0.25-foot layer of reddish-brown earth, also presumably burned, with some associated charcoal. A small patch of red ochre accompanied the burial. Associated artifacts were not present, other than one rubbed hematite stone. Feature 37 lay in dark mixed earth next to a deposit of loose gray soil. A 0.7-foot thickness of gravel and mixed earth lens was encountered directly below the burial. Laboratory examination disclosed that of the large amount of small calcined bone fragments recovered, many have a human character. However, only one, a terminal phalanx, can be definitely identified as human.

Feature 38.—This burial consisted of some verdigris-preserved bone fragments unearthed with accompanying burial furniture in square N6E2 at an elevation of 2.7 feet. It occupied an oval area, 3.5 (E-W) by 2.5 (N-S) feet with a thickness of 0.5 foot. A basal fire bed of orange-red color comprised the larger visible portion of this feature. It was associated with a patch of red ochre about 0.7 foot in diameter. In the center of the fire bed was an 0.5-foot deposit of brown earth in which was found a string of 61 copper beads, 1 fragmentary chert drill, 1 fragmentary chert nodule, and 1 ordinary beach pebble. The copper-preserved bones associated with the beads were also recovered in the brown-earth area. Within this feature, 1 foot to the east of the human remains, a small pile of 88 chert flakes was encountered lying in a small patch of red earth.

Feature 39.—A bundle burial was unearthed in square N7W1 at an elevation of 2.6 feet from datum and at a depth of 5.0 feet from the mound surface. This feature was circular in shape measuring 2.0 feet in diameter and 0.1 foot in thickness. A number of bone fragments, too small for definite identification, were recovered. The flat bones were too thin and the long bones were too slender to be human. These remains were not accompanied by any artifacts. They were lying on a layer of reddish-brown earth beneath several pieces of stone to the southwest of feature 8 (rockheap). Feature 39 lay nearly directly over feature 42.

Feature 40.—One of the most productive mound burials was uncovered in squares N11–0, N11E1 at an elevation of 2.5 feet from datum or 8.0 feet from the mound surface. This feature was ovate in outline, measuring 5.0 feet (NE–SW) by 2.0 feet (NW–SE) and 0.5 foot thick. There was a 3-foot covering of loose light-gray soil over the burial, at the base of which was a layer of brick-red earth between 0.25 to 0.05 foot thick. The earth surrounding the feature was solidly packed, dark mixed earth. The funerary furniture accompanying the little skeletal remains recovered was apparently carefully arranged. The total human remains found were a pair of unerupted deciduous lower molars (M2) stained green from contact with copper. The copper preservative was derived from the verdigris of one string of 233 copper beads which had been carefully looped in the center of the feature, surrounded by other material. A small string of 38 pearl and shell beads lay 3 inches away from the copper string. Some fibrous and woody matter was also preserved by the action of the copper salts. Other specimens found in association with this burial were 7 chert blades, 1 celt of nonferruginous stone, 1 chert drill (pl. 28*i′*) and 1 fragmentary chert drill, 1 hematite hemisphere, 1 abrading stone, 3 grooved whetstones, some flint flakes, a small patch of black carbonized particles, 3 concentrations of red ochre (the largest measuring 1.5 feet in diameter), 3 concentrations of yellow ocherous powder, and 2 small concentrations of whitish powder. One of the white-powder patches, containing a very high amount of phosphate, lay directly above one of the grooved whetstones. Red ochre was associated with the copper beads which were looped over the four largest blades. The hematite hemisphere (pl. 27*k*) had a hollow underside which lay uppermost. The beads and hemisphere lay on what may have been a covering of skins.

Feature 41.—A domelike capping of loose gray soil (fig. 17), similar to that found in feature 40, was encountered in the excavation of this burial which overlapped the boundaries of squares N9E2–N10E2, N9E3–N10E3, N9E4–N10E4. The base of this feature was situated 2.4 feet above datum elevation and 8.7 feet below the mound surface at this point. It was ovate in shape, measuring 18.0 feet (E–W) by 4.0 feet (N–S) and 2.75 feet thick. Within this feature, which was composed of gray soil, was a smaller ovate patch of dark-brown earth measuring 4.5 feet (E–W) by 1.5 feet (N–S). Gray soil occurred at 0.5 foot below the dark oval stain, continuing downward. This inner feature was surrounded by a thin line up to 0.05 foot thick of what seemed to be organic matter. The latter may have been bark or a similar substance. An 0.8-foot ovate patch of clean white sand 0.3 foot thick surrounded by black greasy dirt was observed in the middle part of this enclosure. Fifteen lumps of semiworked hematite and one faceted piece of hematite were uncovered on the south side of the sand patch. Some charcoal was noted to the northeast of the sand patch. Organic (wood?) matter 1.0 foot wide and 0.05 foot thick was found on the south side of the patch.

Skeletal material uncovered in the eastern portion of the inner feature consisted of parts of two or three cervical vertebrae. These were copper-stained by the preservative action of verdigris from associated copper beads. Arthritic lipping on these vertebrae indicates an age of probably over 40 years. Three fragments of molar tooth caps were uncovered very close by in association with a string of 58 copper beads. The verdigris from the copper beads preserved the teeth from total disintegration. Directly associated with the skeletal remains were 2 strings of 64 copper beads, a deposit of red ochre measuring 0.5 foot in diameter, 1 modified tubular sandstone pipe (pl. 25*k*), and 1 side-notched projectile point (pl. 28*g′*). The beads were lying on a 0.05-foot layer of bark. The pipe lay on reddish-brown soil up to 0.05 foot thick.

Some indications of wood were found within the burial confines and near the sides which might have been part of an entombment or covering of some kind. The organic remains of a log or some other woody material measuring approximately 2.5 feet long by 0.3 foot in diameter was uncovered on the northwest border of the larger enclosing outline. Three smaller woody remains were uncovered on the periphery of this feature. None of these indications were strong enough to be followed in detail.

Arranged in a linear line through the middle of the larger feature on its long axis (E–W) between the inner burial outline and the western border, was encountered the remainder of the associated artifacts. These include 26 chert blades, 1 hematite celt (pl. 26*y*), 2 chert flakes, 2 fragmentary chert rejects, 2 elongate natural flat pebbles, and 4 projectile points. The chert blades were arranged very close together in a line, even overlapping upon each other. They had apparently been laid with the best side up. A heavy patina coating of what appeared to be burned and carbonized organic matter covered the exterior of these blades.

Dark mixed earth was encountered beneath feature 41. An animal burrow, 0.8 foot in diameter, full of light-reddish earth and small pebbles entered the western side of the feature. The burrow was traced from the top of the mound down to below the yellow loam cap into the sterile gravel beneath the mound (fig. 16).

Feature 42.—Excavation in squares N6W1 and N7W1 disclosed a burial at an elevation of 2.6 feet from datum or a depth of 5.0 feet from the mound surface at that point. This feature was 2.0 feet in diameter. There were no associated artifacts. The remains consisted of a poorly preserved bundle burial of what appeared to be an adult, headed north. The skull was crushed and only a few teeth were intact. There were several long bones besides the cranial remains. The thickness of the latter suggests a male adult. Four tooth crowns were recovered for laboratory identification. These are probably upper left Pm2, M1, M2, and M3. There was some charcoal and evidence of burning around the burial. One burned stone occurred beneath the remains. Dark earth was found 0.15 foot below the burial.

Feature 43.—A burial lying in a bed of yellow-brown earth was found in square N7E1 at an elevation of 2.4 feet from datum. The feature measured 6.0 by 3.0 feet with a thickness of 0.45 foot. It consisted of a poorly preserved extended burial headed southeast, and funerary material. The over-all length of what remained of the skeleton measured 5.4 feet. The skull, lying on its left side, was crushed. It faced south. Only the cranium, which was in the better condition, and several pieces of the lower limb bones were preserved. There were five impressions of a small oblong enclosure or entombment found over the burial, indicated by impressions of logs 0.3 foot in diameter in a kind of cribwork, and covering the lower portion of the body from the midregion to the legs. Identifiable fragments of wood were recovered. A tubular stone pipe (pl. 25*f*) was found lying immediately in front of the face. The long axis of the tube was parallel to the face. A worked hematite stone lay at the curve of the neck and a pile of faceted hematite stones lay 1.0 foot south of the jaw. The other associated artifacts were distributed over the lower parts of the burial. The specimens recovered include 7 nonferruginous stone celts, 3 hematite celts (pl. 26 *s*, *w*, *x*), 2 chert flakes, 14 faceted and worked pieces of hematite, 1 hematite hemisphere, 4 complete and 2 fragmentary projectile points, 1 broken blade and 3 fragmentary blades, 1 chert reject, and 1 grooved whetstone. A small quantity of red ochre was also obtained. There was an 0.8-foot deposit of burned clay one-eighth inch thick on the west side of the burial. The center of the burial lay in a shallow depression, the sides being perceptibly higher.

Feature 44.—This feature was excavated in squares N8E1, N8E2, N9E1, N9E2 at an elevation of 2.2 feet from datum. It was 6.0 feet long (NW–SE) by 4.5 feet wide (SW–NE) and about 0.05 foot thick. The basal layer of the feature, a reddish-brown layer of earth, appeared to have three thicknesses. The topmost layer was a thin reddish-brown earth layer lying over an orange-yellow deposit less than 0.05 foot thick. The latter deposit covered a thin layer of white substance which measured less than one-eighth inch in thickness.

A deposit of cremation remains 0.1 foot thick covering an area of 0.9 foot in diameter was found in the center of this feature. These remains consisted of a mixture of charcoal and many unidentified pulverized and charred bone fragments. They were associated with two small deposits of red ochre which occurred next to the bones. A small celt of nonferruginous stone and about 0.05 foot deposit of manganese dioxide were also found adjacent to the bone ashes. Two other small deposits of red ochre were found in the burial area, one associated with a pop-eyed birdstone (pl. 26*d*). The latter lay on its left side coated on the base with a thin layer of whitish material. Between the birdstone and the bone deposit lay a large gabbro celt (pl. 26*h*) and a fragmentary silt-stone hemisphere, both coated on the underside with a thin deposit of white matter. One faceted hematite stone was also recovered.

Two feet to the south of the cremation remains was uncovered a small deposit of black granular material measuring less than 1 inch in diameter. A deposit of white material which may have represented a fragmentary hemisphere was found 1.5 feet to the north of the cremation.

All the artifacts were covered with either a reddish or orange-yellow matter. A small yellowish deposit of earth was especially conspicuous in the southeast quarter of this feature. Underlying this burial was a mixture of loose dark earth.

Feature 45.—Several poorly preserved bones, all postcranial, including the right foot, leg, and right arm of an extended adult burial (probably male) were uncovered in square N10E1 between 2.4 and 1.8 feet above datum elevation. This feature was 5.0 feet long (NE–SW) by 1.0 foot wide (SE–NW). It was not ascertainable at the time of excavation whether the remains comprised a reburial or not. There was no evidence of a pit. The body seemed to have rested on the right side with the feet higher than the rest of the body. The remains lay in dark earth unassociated with any artifacts. There was no evidence of the ribs, vertebrae, pectoral or pelvic girdles. Gray soil was found beneath the dark earth. A patch of fire-reddened earth was observed 2.5 feet south of this burial at approximately the same elevation.

Feature 46.—Two poorly preserved extended adult burials with an accompanying wealth of funerary goods were uncovered in squares N8–0, N9–0 at an elevation of 1.8 feet from datum. The burial area was oval in outline, measuring 6.0 feet (NW–SE) by 3.5 feet (SW–NE) with a thickness of about 0.5 foot. The burials occupied the center of this perimeter, alined in a NW–SE direction. They lay in dark mixed earth and were headed to the northwest. A covering of bark or similar organic matter about one-fourth of an inch thick had apparently covered the remains. Sections of the former had been preserved by the salts from the associated copper beads. Only the lower limb bones or the long bones of the burials were preserved. One patella bone was comparatively well preserved. A mass of white amorphous lumps were uncovered where the cranium of one of the burials should have been. These lumps when examined in the laboratory gave the chemical test for calcium phosphate, an indication of bone. Some of the fragments show cortical bone structure under magnification, hence we may infer that this also was part of the burial proper.

The wealth of data may be judged by the enumeration of the following artifacts recovered from this feature: 1 round stone ball (pl. 26*e*), 33 bone beads (pl. 25*c*), 164 copper beads, 2 chert blades, 3 fragmentary blades, 2 diabase celts (pl. 26 *i*, *j*), 2 hematite celts (pl. 26 *t*, *v*), 3 chert drills, 2 fragmentary chert drills, 28 chert flakes, 1 geode paint cup, 2 barite hemispheres (pl. 27 *h*, *i*), 1 limestone hemisphere (pl. 27 *j*), 1 grit stone or honing stone, 2 hematite paint stones (1 faceted) (pl. 27 *m*, *n*), 1 broken mussel shell, 1 small lot of shell fragments, 7 unworked sandstone pebbles, 1 silt-stone pebble, 2 stone tubes, 3 grooved whetstones and 3 fragmentary whetstones. A quantity of red ochre, yellow ochre, a deposit of graphite, and a small patch of white clay were also noted. The situation of some of these specimens is given in the following feature description.

The skeletal remains, apparently representing two adults lying side by side, were comprised of several poorly preserved lower-limb bones. These were found in the southern part of the feature. From the position of the long bones, these burials evidently headed northwest. The remains of the individual on the right or eastern side of the feature were better preserved than those on the left (western) side. Fragments of five long bones, among which were identified a femur, tibia, and fibula, belonged to the burial on the right side. Fragments of two unidentifiable long bones were recovered from the burial on the left side. At the feet of the former burial was a patch of red ochre and a cremation deposit, each lying under the distal ends of the bones. The cremation remains gave a very high phosphate test, such as one would expect of bone ashes. Several sandstones and a chert blade lay close to the feet. Across the knees was a string of bone beads. A lump of white clay lay about 1 foot below and to the right of the feet.

Several inches to the north of these skeletal remains were two barite hemispheres lying with the convex surfaces up. Close to them was a chert blade.

Lying in about the east-central part of the feature were two celts, a small pile of chert flakes, and a fragmentary shell. The latter was closely associated with one of the celts.

A large pipestone tube (pl. 25*h*) was recovered in two pieces about 1.0 foot to the north and east of the feature's center. It lay on a NW–SE axis with the blocked end to the southeast. A smaller pipestone tube occurred parallel to it in a similar position, 1.4 feet to the west. Some pieces of woody material about 0.05 foot thick were noted lying over the stone tubes.

Two patches of yellow earthy powder, a deposit of graphite, a round stone ball, a patch of white chalky substance, a chert blade, some shale stones, and a string of copper beads were uncovered in the northern part of this feature. Beneath the copper beads was a fragment of preserved bone stained by copper salts.

In the southern and western portion of feature 46 was encountered a group of nine flat shale stones which lay alined over a human lower-limb bone and some smaller bone fragments, the remains of the second individual in this grave. A large deposit of red ochre measuring 1.0 foot in diameter and 0.025 foot thick lay under the stones. The ochre was probably responsible for the reddish discoloration of the earth around these stones.

This was no unimportant burial if the wealth of nonperishable funerary goods is any indication. The remains lay in a matrix of gray soil. No evidence of log tombing or of any structure was noted.

Dark mixed earth occurred below feature 46.

Feature 47.—An oval-shaped burial feature was unearthed in squares N7E3, N7E4, N8E3, N8E4 at an elevation of 1.8 feet. The greatest diameter of this feature was 3.0 feet and the major axis was alined in an east-west direction. It was about 0.05 foot thick. The skeletal remains consisted of what was probably a reburial of the long bones of an adult. The bones, poorly preserved, were approximately 1.0 foot long. They lay in a thin stratum of brownish organic matter. Beneath the skeletal remains were a half handful of 68 small white quartz pebbles, the only associated material. These pebbles and bones lay to the east of the feature's center. Two of the pebbles were about twice the size of the others. Black mixed earth was found below the burial.

Feature 48.—The remains of a poorly preserved adult postcranial skeleton were found in squares N9W1, N9W2 at an elevation of 1.4 feet from datum. The lower-limb bones were among the major items recovered. They were found in a feature of somewhat irregular and poorly demarcated outline, measuring 2.0 feet (N–S) by 1.3 feet (E–W) with a thickness of 1.0 foot. Only traces of the pelvic girdle were present, while the pectoral girdle was absent. Some loose soil was scooped out of a small hollow where the head may have rested. A flint blade was recovered where the left shoulder may have been. This burial, lying in a mixture of dark earth, sloped somewhat. Associated artifacts include one fragmentary chert blade, one fragmentary faceted stone of hematite, and one small natural geode paint cup. The chert blade lay close to one of the bones.

Feature 49.—Some very fragmentary and poorly preserved long bones measuring about 1.0 foot in length were recovered in squares N5E1, N6E2 within a triangular bed at an elevation of 1.4 feet from datum. The outline of this feature measured 7.0 feet in diameter with a maximum thickness of approximately three-fourths of an inch. The bones, presumably of an adult, were lying on an east-west axis closely associated with a patch of red ochre. The latter deposit lay on the northern side of this feature. A string of copper and bone beads were recovered 0.25 foot to the west of the bones. Apparently the preservation of the skeletal material was due to the salts from the copper beads. A three-quarter grooved ax (pl. 26*g*) was found 1.0 foot to the north and east of the bones. An almost square depression 0.9 by 0.9 and 0.05 foot thick was noted close to the center of this feature. The earth in this particular square was somewhat harder than the rest of the feature, which was overlaid with an orange-colored deposit. The latter's depth was from about one-fourth to one-sixteenth of an inch with a trace of reddish earth or red ochre about one-sixteenth inch extending over all. This bed sloped perceptibly to the south, or outer edge of the mound. Another group of copper beads, besides those mentioned above, was found in the lower central part of this feature arranged in a circle. A small patch of red ochre 0.1 foot deep, associated with six chert flakes, was uncovered to the east of the square depression. A deposit of whitish material was gathered from below the red ochre. Enumerating the remainder of the artifacts which were recovered from various parts of this feature, the total assemblage includes 1 grooved ax, 16 copper beads (2 strings), 1 fragmentary chert blade, 1 hematite celt (pl. 26*u*), 1 piece of reject chert, 1 flat round sandstone, and 1 ordinary pebble.

Feature 50.—The postcranial skeletal remains of an adult were found in square N10W1 at an elevation of 1.2 feet from datum, lying in an ovate-shaped lens of light-brown earth mixture. This feature measured 3.5 feet (N–S) by 1.5 feet (E–W) by 2.0 feet thick. Only traces of the upper limbs, the lower limbs, and the vertebrae remained, all in a poor state of preservation. There was observed a trace of the pelvic girdle. The pectoral girdle was absent. The lumbar vertebrae were 1.7 feet lower than the lower-limb bones. There was some reddish-brown earth to the left side of the burial. The bones were quite badly broken and disturbed by root tendrils. No associated artifacts were recovered other than a small natural geode cup stone which was found beneath the distal ends of the lower limbs. The skeleton was oriented with the head to the north.

Feature 51.—The poorly preserved cranial remains of an adult were found lying under a flat oblong stone in square N12E2 at an elevation of 0.5 foot from datum. This feature, measuring 2.5 feet in diameter and 0.1 foot thick, was circular in outline. The stone superimposed over the skull measured 1.0 by 0.9 by 0.2 foot. The burial occurred in a mixture of light-brown earth which contained a considerable amount of gravel. Closely associated with the remains were 1 barite bead (pl. 25*d*), 1 chert blade, 1 fragmentary chert blade, 2 nonferruginous celts (1 made from a flaked artifact (pl. 26*r*)), 1 drill point (pl. 28*n'*), and 4 projectile points. Feature 51 lay on a bed of red-burned earth which in turn lay on the sterile gravel stratum at the base of the mound.

SUMMARY

The 51 features [8] found in Natrium Mound ranged in elevations from 8.4 to 1 foot from datum, or within a concentrational depth of over 7 feet (fig. 18 *A*, *B*). The bottommost feature was No. 28, located 1 foot above datum. The topmost feature was No. 32, a burial uncovered 8.4 feet from datum, or 3.5 feet from the mound surface.

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[8] The features were arbitrarily divided into two groups—those lacking skeletal evidence, and those containing recoverable skeletal data, as mentioned above.

The features were largely situated in the "primary mound," which consisted of a number of smaller included mounds in a matrix of dark earth. This in turn was capped by a secondary mound composed mainly of loose gravelly soil with a few dark earth stains running through it. There were fewer occupational evidences in the latter mound (figs. 16, 17).[9]

The earthwork seems to have been built by increments as the burials were added. The featural data conform to a single classificatory unit, the Adena complex. Therefore we infer that cultural stratification other than Adena is not present.

Features were interspersed throughout the center of the inner tumulus with two notably heavier concentrations, one at about 4 feet from datum, the other between 2 and 3 feet from datum. This evidence, indicative of a group deposition of the remains is deduced from the field data and notes. It was impossible, because of the conditions imposed, to lay bare all the burials, etc., level by level over the entire excavation.

Considering the top of the prepared yellow-soil cover (average elevation about 1.3 feet above datum) as the base of the mound, the greatest weight of all the features lies somewhere between 2 and 3 feet above the approximate center of the mound base. The majority of the largest and most important features were concentrated near the bottom. The greatest concentration of the burials (identified from skeletal remains) lay approximately 1 foot above the loam floor, decreasing in numbers sharply with increasing height from the base. The burial (feature 32), 8.4 feet above the base, is unusual with regard to this dispersion.

Significantly interesting to note, all the features discovered, except four (features 5, 36, 42, 48),[10] contained observable evidence of former fires. Primary indications were patches and lenses of red-orange fire-burned earth of a loamy consistency pointing to the presence of intense fires. Delimited areas of charcoal, burned gravel, and fire-burned stones were secondary in profusion. Many of the associated artifacts were fractured or discolored by fire.

The importance of red ochre to the cultural complex is attested by the finding of recoverable quantities of this mineral in a little less than one-third of the features.

A pile of 16 burned and broken stones (feature 8) found about 12 feet north of the mound center could not be assigned to any particular purpose. The pile lay about 2 feet over feature 40. These stones may have been related to feature 34, a very productive burial, which lay just to the northeast on the same level.

Not all of the features are shown in the cross sections illustrated.

[10] The latter three features were burials.

Careful attention was paid by the writer and his assistants to any signs of wooden structures, such as post molds. No actual post molds were found, other than the probable recent test hole outside the mound. There was some evidence of tombing, as in feature 43, where indications of a small wooden cribwork were found superimposed over an extended burial. Feature 41 also contained strong signs of some kind of entombment and covering. Feature 46 had definitely been covered with some kind of organic mantle like skins or bark.

What, perhaps, should have been the most productive feature of all (feature 28), the subfloor pit, was actually devoid of skeletal and artifactual remains, with the exception of a single projectile point. This pit, which seemed to be not quite long enough for an average-size extended burial, should not be confused with the hard, well-made clay basins of some mounds. Careful search failed to reveal any structural details within or directly outside this feature. Incidentally, the latter was situated a little to the east of center. The heavy degree of burning indicated and the large amount of ash-gray soil outside the pit points to the possibility that it may have been a cremation pit. It could have served for such use on successive occasions.

Caps of ash-gray soil (see Appendix 1 for description) were found superimposed over six features (Nos. 20, 30, 34, 40, 41, 43). This apparently was not a circumstantial coincidence. The texture of the soil resembles ash deposits, presumably the product of cremation fires.

Twenty of the fifty-one features contained osseous material in various stages of preservation, mostly very poor. Some of the burial remains were fortuitously preserved, such as copper-stained bones from several burials. This would immediately suggest that many of the remaining features, in all probability, were also burials from which the skeletal matter had since disappeared. It is not improbable that the acid nature of the mound had a great deal to do with the poor preservation of the skeletal remains. Acid soil of clay [11] or loamy texture is not particularly well adapted to the preservation of bones. The better-preserved skeletons at Natrium did not lie immediately on the patches of reddened loam [12] frequently associated with the features.

Cautiously speaking, one might say that mound burials are usually accompanied by burial furniture, with or without red ochre, an observation strengthened by Webb and Haag's (1947, p. 68) comments. It is unneccessary to state that stone or nonperishable items were not the only offerings interred with the burials, since we have distinguished the remains of organic substances in several features. Some features in the first group (features 1–3, 8–11, 13, 23, 24, 26, 27, 29–31) lacked both skeletal material and artifactual data. On the other hand, some burial features (features 33, 36, 39, 42, 45, 47) contained no associated funerary objects. An exception might be made of feature 47 in which a tight clump of 68 pebbles was found. Hence, it is seen that we cannot use the criterion of grave goods, in this instance at least, to indicate whether we have burials or not. Perhaps the surest measure of ascertaining the former presence of burials is by chemical tests of the soils. (See Appendix 1.) A very high proportion of bone phosphate in a suspected area is a good positive clue to a burial or at least osseous matter.

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[11] According to pedologists or soil scientists (Kellogg, 1941, pp. 51–52, 71–72), clay has the greatest influence on the chemical activity of the soil. Because of its physical characteristics, clay tends to hold and concentrate a reservoir of soluble substances.

[12] These are the deposits which are probably synonymous with the "puddled clay" of Webb and Snow (1945, p. 73). Webb and Haag (1947, p. 68) claim that puddled clay when associated with a burial results in the total disintegration of the skeletal remains. According to these authors, this is caused by the acidity of the clay.

Not much can be said regarding the physical remains of the Natrium Mound dead. The major remains, those identified, seem to be adult and male. In all, there were seven partial reburials and bundle burials (features 36, 39 [human?], 42, 45, 47, 49); six extended burials (features 33, 35, 43, 46, 48, 50) of which features 33, 48, and 50 represent postcranial burials; two cremations [13] (features 37, 44) and two finds of crania (features 32, 51). Several of the extended skeletons were too poorly preserved for detailed study. Feature 48 lay at the feet of its neighboring burial, feature 50. There were no flexed burials. Some of the noncremated bones had blackened areas or spots, which may have been due to one or two causes—extraneous conditions imposed by the nature of the soil or the possibility that they had been coated with some foreign matter at the time of interment. Osseous fragments preserved by copper verdigris were also encountered. All of the adult teeth showed indications of heavy attrition. The presence of so-called "dental pearls" (Webb and Funkhouser, 1930, pp. 215–216), a type of enamel nodule deposited near the junction of the roots and crown, was observed on three molars from feature 36 and one from feature 43.

The cremated remains may represent communal deposits of the dead while the other burials may have been accorded the honor of separate interment. Whether the cremated bones are those of defleshed and dried bones or skeletons in the flesh, the writer cannot say positively. However, if checking of cremated bones is any sure indication of dried and defleshed bones (Webb and Snow, 1945, pp. 188–189), those examined appear to be defleshed, a circumstance evident both in Hopewell and Adena burial customs. It is more frequently found in the former.

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[13] Five additional features (Nos. 22, 25, 34, 40, 46) were later found to have contained cremated remains. These remains, typified as lumps of whitish matter, tested physically and chemically as bone ash.

Mention has been made of the erection of small mounds of earth over several features. Viewed in horizontal plan, the long axes of the burials are oriented roughly parallel to the mound perimeter.

As a matter of cursory note, burial feature No. 34, containing the copper breastplate, appears to be one of the more interesting features uncovered (pl. 24*h*). It was one of the few burials capped with a low dome of ash-gray soil. The unusual circumstance was the association of the figurelike arrangement of the copper beads. They were undoubtedly draped over the burial in some kind of zoomorphic figure which had symbolic meaning. Parallels to this find are not known to the writer, although we can draw on similarities from effigy mounds, pictographs, etc. The breastplate was apparently one of the dominant items in this burial. The textile, a fragment of which was preserved under the copper plate, probably extended over the whole burial originally. A single piece of copper verdigris-preserved human bone and a small patch of bone ashes represent the total osseus remains. There appeared to have been a bark mantle covering the entire feature. There was no evidence of a prepared tomb construction of any kind present.

THE ARTIFACTS

INTRODUCTION

A trait list of the artifacts recovered from Natrium Mound is given below and is followed by a description of these specimens. This section is divided into five categories. These groupings with the included number of specimens are: Polished stone artifacts, 51; rough stone artifacts, 66; chipped stone artifacts, 263; copper artifacts, 709; and miscellaneous artifacts, 152. The latter grouping is a kind of catchall. Under these categories are grouped various subdivisions. The total artifacts (counting the beads, of which copper beads alone number 708 items) amount to 1,241 specimens. No mention can be made here of the artifacts supposedly recovered at an earlier date from Natrium Mound and in possession of the Arrick family. The writer examined several Indian relics which were reputed to have been unearthed from the top and side of the mound; but positive identification could not be made by the owner. Because of this uncertainty, these specimens are not included in the itemization.

Following the artifact descriptions is a summary of this section.

ARTIFACTS TRAIT LIST

Polished stone artifacts:	
Ax, ¾ grooved	1
Balls, round stone	2
Birdstone	1
Boatstone, excavated	1
Celts:	
Nonferruginous stone:	
Oblong poll	11
Rounded poll	3
Pointed poll	5
Hematite:	
Oblong poll	7
Pointed poll	1
Fragmentary	1
Total celts	28
Gorgets:	
Reel-shaped	1
Pendant	1
Semikeeled	1
Total gorgets	3
Hemispheres:	
Hematite	7
Barite	2
Limestone	1
Silt stone	1
Total hemispheres	11
Pipes:	
Modified tubular (T-shape)	1
Tubular	3
Total pipes	4
Total polished stone artifacts	51
Rough stone artifacts:	
Abrading or sinew stones	3
Honing stones	7
Whetstones or grooved silt stones	13
Pestle-shaped stone	1
Hammerstone (?)	1
Faceted hematite paint stones	40
Hematite cupstone	1
Total rough stone artifacts	66

ARTIFACTS TRAIT LIST—continued

Chipped stone artifacts:	
Blades:	
Ovate base	139
Flat base	57
Stemmed rectangular base	9
Stemmed ovate base	8
Fragmentary blades, not classifiable	5
Total blades	218
Projectile points:	
Flat-stemmed base	17
Ovate-stemmed base	3
Side-notched base	2
Base notched on one side	2
Ovate base	2
Triangular, crude (reject?)	1
Fragmentary specimens	4
Total projectile points	31
Scrapers	1
Drills:	
Flat base	4
Pointed base	2
Rounded base	1
Rounded-stemmed base	1
Fragmentary specimens	5
Total drills	13
Total chipped stone artifacts	263
Copper artifacts:	
Copper gorget, reel-shaped	1
Copper beads	708
Total copper artifacts	709
Miscellaneous artifacts:	
Beads:	
Bone	33
Pearl	36
Shell	2
Barite	1
	72
Worked bones	2
Bear canine tooth	1
Worked piece of coal	1

ARTIFACTS TRAIT LIST—continued

Miscellaneous artifacts—Continued	
White pebbles	68
Natural sandstone pendant (?)	1
Potsherds (Fayette Thick)	2
Pottery, odd fragments	2
Shells (worked?)	2
Textile remains	1
Total miscellaneous artifacts	152
Total artifacts	1, 241

The artifacts in the trait list are discussed in detail under separate headings below.[14] All the dimensions in the description are given in centimeters.

DESCRIPTION OF ARTIFACTS

POLISHED STONE

Grooved stone ax.—One comparatively thick ¾-grooved ax (pl. 26*g*) of gabbro was recovered from feature 49. The groove is deep with prominent borders or flanges. The ax is 15.4 cm. long and about 85 percent polished. The butt is rather heavy compared to the bit which is tapered. The occurrence of a ¾-grooved ax in an Adena Mound is interesting and appears to represent a new trait item. Webb and Haag (1947, p. 100) have listed the fully grooved ax (trait No. 230) as a new Adena trait. Griffin (1943, pp. 57–58) notes Putnam's finds of ¾-grooved axes which the former classifies among Adena-Hopewell traits. Grooved axes are rare in Adena and in Ohio-Hopewell.

Round stone balls.—Two round balls were found associated in two Natrium features. One round or imperfectly spherical-shaped ball was found in feature 46. This ball (pl. 26*e*), made of dense stone, averages about 3.3 cm. in diameter. Another ball found in feature 20 is also an imperfectly shaped spheroid. It is about 4.5 cm. in diameter and similarly made of dense stone (pl. 26*f*).

According to Webb and Snow (1945, p. 88), stone balls are a rare Adena trait.

Effigy birdstone.—A birdstone (pl. 26*d*) of gray sandstone was found in feature 44 in association with cremation remains. The "bird" is a conventionalized figure showing the beak, head, and shoulders. The eyes are prominently extruded projections with flat surfaces on the ends. The diameter of the eyes is 1.1 cm. The figure has a short, thin slit 0.8 cm. long for the mouth. The base of the birdstone is a well-trimmed ovate platform measuring 7.0 by 4.1 cm. The whole bust is 4.5 cm. high. There are two conical perforations drilled at an oblique angle from the base end on the long axis. They taper from 0.8 to 0.4 cm. in diameter.

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[14] The artifacts are given Adena trait list numbers as compiled by Webb and Snow (1945) and Webb and Haag (1947) in the tabulation entitled "Adena Trait List, Natrium Mound" (p. 376).

This is the first recorded instance of a birdstone, so far as the writer knows, which is definitely associated with an Adena Mound. This is one of the anomolies which places Natrium Mound out of the ordinary. A birdstone, itself considered a rarity in West Virginia, was found 200 yards north of the Beech Bottom Mound (Bache and Satterthwaite, 1930, p. 144).

A birdstone, illustrated in Moorehead (1922, ill. p. 139; text p. 136) from the Hopewell Mound area in Ross County, Ohio, bears a startling resemblance to the Natrium specimen. This poses an interesting problem of the cultural affiliations with the Hopewell complex. Birdstones are most numerous in the Ohio Valley, although they occur widely over the Northeast in general (Holmes, W. H., *in* Hodge, 1907, pt. 1, p. 148). Webb (Webb and Snow, 1945, p. 216) believes that birdstones were among a class of objects used as atlatl weights.

Boatstone.—A singular type of well-finished steatite boatstone (pl. 25*i*, *j*) was recovered, hollow end down, from feature 21 in association with a cache of over 100 chipped blades (pl. 24*i*). It is in the shape of a hollow bell, 4.5 by 6.7 cm. across the oval bottom and 5.5 cm. high. The walls average about 0.3 cm. thick and the depth of the hollow from rim to apex is 4.3 cm. There is a shallow groove 0.3 cm. wide running over the top of the boatstone on a longitudinal axis which terminates in two holes at either end. These holes, 0.5 cm. in diameter, are located 1.5 cm. from the base of the specimen. The upper outside periphery of these two opposing holes is smooth and there is some evidence of wear on the lower inside of these apertures. No great amount of wear is present on the sides of a central hole which is situated about midway on the lateral curving face of the boatstone. This hole, also 0.5 cm. in diameter, is 2.6 cm. from the hollow base. It is very likely that this object was suspended or tied by a string passing through the two opposite holes and fitting in the groove. No possible use for the single hole in the face of the boatstone could be determined.

True excavated boatstones do not seem to be recorded heretofore for the Adena complex, although Webb and Haag (1947, p. 100) list a copper boatstone from the Fisher site. Apparently this negates an earlier comment (Webb and Snow, 1945, p. 334) which disclaims the presence of boatstones in Adena.

Holmes and Fowke (*in* Hodge, 1907, pt. 1, p. 157) illustrate a boatstone almost identical to the Natrium Mound specimen. Tremper Mound, which Webb and Snow (1945, p. 213) list on their chart as composed of Adena and Hopewell elements—or at the bottom of the Hopewell cultural ladder (Webb and Snow, 1945, p. 140)—contained several hollowed copper and stone boatstones (Mills, 1916, pp. 364–367). Pebbles were contained in the hollows of at least two of these objects.

Boatstones are thought to have been used as weights for atlatls or throwing sticks. However, the associated presence of pebbles in the hollowed part of these stones (at least in the Tremper Mound boatstones) would seem to pose a difficulty to their use as atlatl weights.

Celts.—Of the total of 28 celts recovered, there are 19 of nonferruginous stone, commonly gabbro—a nongranitic igneous stone—and 9 of hematite (one of the latter is broken). All except one of these specimens were found in associated features.

Nonferruginous stone celts.—The 19 nonferruginous stone celts range in length from 4.0 to 13.5 cm. or about an average of 8 cm. long. Eleven of these celts have square or oblong butt ends (pl. 26 *j* (damaged poll), *k*, *p*, *q*, *r*). Five have pointed and semipointed ends (pl. 26 *h*, *i*, *o*) and three have rounded butts (pl. 26 *l*, *m*, *n*). With the exception of three specimens, all the celts were made of diabase, principally gabbro stone. Two of the three specimens not of gabbro were made of cherty stone. One of the latter had been reworked from the midsection of a broken flaked blade (pl. 26*r*). The third specimen was made of gneissic stone which had deteriorated badly, although there are still some traces of the original polish present on some of the unrotted surfaces. Not all the celts of diabasic stone were well polished. Five specimens bore only ⅓ to ⅔ polish. In these cases, the butt ends were left rough-pecked (pl. 26 *j*, *k*).

Hematite celts.—One fragmentary celt, consisting of the bit end 6.5 cm. long (pl. 26*a′*), is included among the collection of nine hematite celts (pl. 26*s*–*a′*). Among these are seven rectangular and oblong polled butts and one pointed poll butt (pl. 26*z*) ranging in length from 3.0 to 12.0 cm. with an average length of 5.7 cm. The 12.0 cm. celt (pl. 26*s*) is out of the ordinary, since it is 5 cm. longer than the next longest specimen.

Hematite celts constitute nearly one-third of the total number of celts recovered, indicating that hematite was a popular material. Its strength and durability were probably much in its favor, making up in these qualities for the longer length and easier manipulability of the commoner nonferruginous stone materials.

Nonferruginous stone and hematite celts are listed by Webb (Webb and Snow, 1945, p. 88) as Adena traits Nos. 123 and 124, respectively. It is indicated that rounded pole-end celts are more common on

Adena village sites than other types. Hematite celts, while used by the Adena people, are reportedly not as numerous as celts made of other stones.

Gorgets, stone.—Three gorgets of polished stone were found in Natrium Mound. These gorgets are reel-shaped, pendant-shaped, and semikeel-shaped, respectively (pl. 26 *a*, *b*, *c*). They are described in that order.

The reel-type gorget was found in situ in the general excavation of the mound-fill, unassociated with any other remains. It has concave sides and is made of banded gray slate, well polished all over. This artifact is 11.9 by 8.5 cm. across the wings at the greater dimension and 0.65 cm. thick. There are two conical holes drilled from one face only (uniconical holes). These holes are 0.7 and 0.75 cm. wide, tapering to apertures 0.25 cm. wide. They are 3.7 cm. off center.

The pendant-shape or suspension type found in feature 25 is made of banded gray slate. It is flat and trianguloid in outline with a single hole near the apex and expands to a width of 3.6 cm. at the base. Unlike the other specimens with drilled holes, these apertures (diameter 0.55 cm.) were bored from both sides (biconical holes). This gorget is 0.9 cm. thick at the central cross section, tapering toward the ends, and is well polished and smoothed all over.

The third gorget—a stray, encountered in the general mound fill (N12E2)—is the semikeel-shape gorget. This specimen is made of well-polished dark-gray banded slate with two perforations drilled from the flat underside. It has a flat rectangular base 9 cm. long by 5.1 cm. wide with a convex surface 2.9 cm. high. The holes are uniconical, tapering from a diameter of 1.05 cm. at the base to 0.35 cm. at the convex surface.

Gorgets of the type described above are characteristic Adena traits listed by Webb (Webb and Snow, 1945, p. 85) as traits 112, 114, 115. The uniconical perforation is a particularly important and diagnostic Adena trait (ibid. p. 85, trait 116). It is suggested that the reel-shape and pendant-shape gorgets are true suspension-type ornaments, while the semikeel-shape gorget may be an atlatl weight. Webb (1941, pp. 211–212) in discussing reel-shape objects, intimates that the simpler shallowly concave-sided stone reel is the earliest of this type.

Hemispheres.—A total of 11 hemispheres were found, 7 of which were of hematite, 2 of barite, 1 of limestone, and 1 of silt stone. One possible hemisphere of soft white material also occurred. They have either rounded or ovate basal perimeters which are a little over 4 cm. in diameter. The heights of these specimens range between 2.4 and 3.0 cm.

Descriptions of the hematite and barite hemispheres follow:

Hematite hemispheres:

Feature 20.—One conical hemisphere (pl: 27*l*), well smoothed and finished. It is flat-bottomed, 4.2 cm. in diameter and 2.4 cm. high.

Feature 25.—Four ovate, flat-bottomed specimens, well finished all over. One hemisphere has charred textile remains adhering to the base. The dimensions given in the following tabulation are the heights and the maximum and minimum basal diameters, in that order:

Specimen (*a*)—3.0 by 5.2 by 4.4 cm.
Specimen (*b*)—2.8 by 5.0 by 4.3 cm.
Specimen (*c*)—3.0 by 4.5 by 3.7 cm.
Specimen (*d*)—2.8 by 5.2 by 4.2 cm.

These artifacts were found lying close together, convex side up.

Feature 40.—One specimen, 4.8 cm. in basal diameter and 2.4 cm. high. It is well finished all over (pl. 27*k*). There is a concavity on the under side 0.6 cm. deep and 3.1 cm. across. It was lying with the concave side up. This was the only concave-bottomed hemisphere recovered and the only one found with bottom up.

Feature 43.—One specimen, 4.3 cm. in basal diameter and 2.5 cm. high. It is moderately rounded at the top and well polished. The bottom is flat.

Barite hemispheres.—Two barite hemispheres (pl. 27 *h*, *i*) occurred in association with a burial, feature 46. The base of a chert blade was closely associated with them. The hemispheres are especially well polished and trimmed with plano-convex shapes. Both are ivory white in color, bearing a few yellowish-brown specks and discolorations. The dimensions are as follows: 4.7 cm. diameter by 2.5 cm. high; 4.2 cm. diameter by 2.7 cm. high. The former has a more circular basal perimeter and a rounded surface, while the latter's perimeter is somewhat ovate with a more pointed top.

Limestone hemisphere.—A badly rotted limestone hemisphere (pl. 27*j*), its convex side up, was found associated in the same burial above (feature 46) resting on some bones. Fragments of a flat bone, which evidently had completely covered the under side of the hemisphere, clung to its flat bottom. It is 2.5 cm. high and 3.8 cm. in diameter with a shape that is like that of half an egg.

Silt-stone hemisphere.—Another hemisphere of fragmentary, almost claylike-textured silt stone occurred in the feature 44. This hemisphere was practically disintegrated, leaving only a few measurable fragments. It originally had been 3.5 cm. in diameter and over 2 cm. high, so far as could be determined. It lay with the rounded surface up.

A white deposit of material roughly representing a flattened rounded pellet or possible hemisphere, 3.7 cm. in diameter and 1.8 cm. thick, was found associated with the same feature. Its principal constituent appears to be a material high in calcium and phosphate.

Hemispheres occur as an Adena trait in various materials, including limestone, sandstone, barite, basalt, and hematite. The latter, according to Webb and Snow (1945, p. 89), are not very frequently found. They are considered to be rubbing or polishing stones or even abrading stones (Hermann, 1948, pp. 328, 332). Certainly all those recovered in the Natrium Mound have been considerably well polished and carefully shaped. It does not seem probable that such well-trimmed objects were used as utilitarian pieces, especially in the presence of cruder objects which could have served the same supposed purpose. However, no alternate possibility can be offered for their use.

The measurements given for the specimens above are average for this group of items. The occurrence of so many hemispheres in one mound is singularly interesting.

Pipes.—Four stone pipes, including one modified and three tubular pipes, were recovered.

Modified tubular pipe.—A light-tan, fine-grained sandstone T-shaped pipe (pl. 25*k*) was found in feature 41 associated with other burial goods. It is smoothed but not well polished. There are two parts to the pipe, a somewhat curved barrel 14 cm. long drilled for the bowl to a depth of 8 cm. where the mouthpiece—a tapered platform appendage—meets it. The mouthpiece is 3.2 cm. at the broadest width and 5.5 cm. long (the latter measurement to the bowl's center). The stem hole, of slightly ovoid shape, is 0.7 cm. in diameter. The barrel measures 1.4 cm. on the inside diameter and 2.0 cm. on the outside diameter at the mouth.

This type of pipe is commonly called the "modified tubular pipe." [15] A similar modified tubular pipe with a flattened mouthpiece illustrated by Mills (1916, p. 362, fig. 89) was recovered from a Hopewell (Tremper) Mound which Webb (Webb and Snow, 1945, pp. 140, 196, 214–215) postulates as an "early" Hopewell site. It may have been partly contemporaneous with Adena sites. This mound yielded a large and important collection of typical Ohio Hopewell platform and effigy pipes, placing the finding of the lone modified tubular pipe in an anomalous position.[16] According to Mills (1916, p. 362) this specimen was part of another contemporaneous culture, which he wrongly designated as Fort Ancient (Webb and Haag, 1947, pp. 89–95). The modified tubular pipe is noted by the same authors (ibid. p. 100, trait No. 219) as an item "not heretofore listed" as an Adena trait. The Fisher site was declared to be a late Adena site by the above authors, thus specifically indicating the relationship of the modified tubular pipe.

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[15] It seems to the writer that but little modification would be necessary to turn the modified tubular pipe into the true platform type pipe.

[16] Three tubular pipes also occurred in the Tremper Mound.

Tubular pipes.—Three polished-stone tubes of the flat-based or blocked-end kind were found with associated remains at Natrium. All the tubes are of gray pipestone, commonly called Ohio pipestone or Ohio fire clay. They are of varying shades of light-gray color with interspersed speckling of white. All the tubes were exceedingly well finished, and it is obvious that especial care had been taken in their manufacture. The final polish was applied longitudinally, as indicated by the finish streaks. The largest of the tubes was broken when found in place, indicating perhaps that the breakage had occurred at the time of interment. Each one of the pipes has patches of dark stains or clots which are unevenly distributed on the surfaces. These discolorations may have come about from the minerals in solution in the soil, or from the nature of the presumably associated—and since deteriorated or decayed—matter. Two of the pipes contained small pebbles about the size of large peas. It is not certain exactly how deep within the tubes these pebbles occurred, but they were originally well within the bores. Both of these pellets were of stone, one a well-worn quartz pebble; the other, of rough granular sandstone. The reason for their association is not known to the writer. The contents of each of these pipes was a dark sand containing small flecks of what proved to be burned carbonaceous matter.[17] Two of the tubes are moderately blackened on the inside while a third shows little discoloration. Each of the specimens exhibits circular striae on the inside derived from the scoring action of the borer. The holes at the base end are somewhat off center, suggesting that the position of the hole at the blocked end was determined by the course of the boring from the mouth to the base. The finishing touch of these apertures was performed at the base end once the barrel hole had been pierced through.

The pipe measurements are as follows: Specimen from feature 43 (pl. 25*f*) is 14.5 cm. long, 2.5 cm. in diameter at the mouth, 2.4 cm. in diameter at the middle and 3.3 cm. in diameter at the base. On the inside dimensions it is 1.8 cm. in diameter at the mouth and 0.65 cm. in diameter at the basal hole. There is approximately a 0.15-cm. thickness of brown crust at the basal end. This pipe had a quartz stone pellet (pl. 25*g*) in it. The exact positioning of the pellet within the tube was uncertain upon discovery. It seemed to have come from well inside the pipe, associated with the sand and carbon particles.

The large tube from feature 46 is 31.0 cm. long (pl. 25*h*). Its outside diameters at the mouth, middle, and basal sections are 2.8, 3.0, and 3.8 cm. respectively. Its inside diameters are 1.8 and 0.5 cm. at the mouth and basal hole. This pipe had a burned pebble of sandstone in it. The pellet came from well within the pipe. Another tube, 22.5 cm. long, from the same feature measures 2.6, 2.0, and 3.5 cm. on the outside diameters of the mouth, middle, and basal sections. It measures 2.0 and 0.7 cm. on the inside diameters at the mouth and basal holes. No foreign matter other than charred matter and sand was found inside the bore.

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[17] Tests made on samples of this matter by the Federal Bureau of Investigation did not yield any conclusive evidence (letter July 21, 1950).

The chemical composition of the stone material is presumably identical with that given by Mills (1916, pp. 290–291) for the Ohio fire-clay tubes.

The writer is inclined to accept Bache and Satterthwaite's (1930, pp. 152–154) conclusions that these pipes were probably used for ceremonial smoking. Kercher (1949, p. 62) also believes that at least one of the tubular clay pipes which he reports was used for smoking. Webb (Webb and Snow, 1945, pp. 86, 334) casts doubt upon the use of stone tubes for smoking purposes, seeming more inclined to accept them as shaman medicine tubes.

The tubes for Kentucky illustrated by Webb (1940, fig. 34, p. 56) have tapered or beveled mouthpieces, quite unlike the majority of those found at the Beech Bottom Mound (Bache and Satterthwaite, 1930, pls. 8, 9, 10, 16, 17), which are like the Natrium Mound finds. These pipes have flat-based mouth ends, of which some are flared. The materials used are also Ohio pipestone. The technique of manufacture of the Natrium Mound tubes agrees with that described by Bache and Satterthwaite (1930, p. 152).

ROUGH STONE

Honing stones and abrading or sinew stones.—Seven stones which may be classified as honing stones (pl. 27 *c*, *d*, *e*) were recovered from feature 46 and three sinew stones or abrading stones were found in features 35, 40, and 46 (one in each). The honing stones are handy-sized flat pieces of natural standstone, which exhibit signs of attrition or wear on one or more surfaces and on the ends. These stones are not to be confused with the whetstones, since they do not bear the grooves of the latter. Neither are they of the same composition, since the honing stones are of more gritty sandstone while the whetstones are of finer silt stone. Although honing stones are not unusual as a class of utilitarian artifacts, their occurrence in a mound associated with a burial is apparently out of the ordinary.

The abrading or sinew stones are of light-tan-colored, fine sandstone. Edges of the sinew stone from feature 35 (pl. 27*a*) bears especially deep cuts, one of which cuts the long axis of the specimen on both sides. The stones from features 35 and 40 have cut marks on both surfaces while the abrading stone from feature 46 (pl. 27*b*) is cut on one side only. These marks are especially deep at the perimeters.

Documentation of finds of these objects is poorly represented. It is probable that many of these artifacts were lumped in the whetstone category. Webb and Snow (1945, p. 89) list trait No. 127 as "abrading stones," which presumably includes the objects described above.

Whetstones or grooved silt stones.—Thirteen so-called whetstones or grooved tablets were found associated with other featural material in the mound. Broken or fragmentary whetstones are the rule rather than the exception. All the tablets, which are made of silt stone, are flat, and approximately palm-size, apparently for easy handling. They have one or more grooves worn on either one or both faces. The grooves average about 5.0 cm. long by 0.8 cm. wide by 0.15 cm. deep. They are shaped like shallow troughs.

Experiment with some of the smaller hematite celts showed that they fitted in the grooves very well when held sideways on the long axis. This suggested the possibility that these silt stones may have been used as shaping stones for hematite celts. Further examination of the shallow troughs disclosed that some of them had at least one end which is prowlike in shape. This may have come about from the bit end of the celt breaking the softer edge of the silt stone as the ferrous stone was rubbed back and forth in the groove. One specimen (pl. 27*f*) found in feature 35 throws additional light on the use of these grooved silt stones. This artifact was recovered with an associated faceted hematite stone in situ in one of the grooves. Not only does this piece of hematite (3.8 cm. long by 0.9 cm. wide) fit its groove, but it may be juxtaposed into the four other grooves on the same face of the stone. The facets of this oblong hematite piece may be fitted equally well into the four grooves on the opposite side of the silt stone. There are traces of brown hematite rubbings on the latter artifact. The origin of these rubbings is obvious enough. However, in addition there are some red ochre stains on the stone (none in the grooves) which seems significant. Trial shows that the hematite when rubbed on the silt stone gives a brownish deposit, not the bright red of the ochre powder so abundant throughout the mound (see red ochre under Analyses of Soil Samples and Mineral Materials in Appendix 1).

A grooved silt-stone tablet which occurred in feature 46 was partially covered on one side with a thick coating of sulfur-colored, claylike material. This material had a lumpy texture, and looked as though it had been once of pastelike consistency. It is possible that it had been worked on the grooved stone. Two other grooved silt stones bear an association to other foreign material in this category.

One from feature 32 (pl. 27*g*) is partially encrusted on its top surface with about a 0.1 cm. thickness of black granular matter, an organic residue, which seems to be a product of combustion. Another grooved silt stone found in feature 40, was recovered also in situ partially covered with a heavy thickness of crumbly white substance. This coating, which showed the effects of intense heat, proved to be very high in phosphate content, indicating that it was probably bone ash or cremation residue. Microscopic examination showing particles and casts of boney spicules confirmed this.

Grooved tablets [18] are supposed to have been commonly used in the manufacture of bone implements like bone awls, and in the shaping or sharpening of heavier stone items. The functional possibilities for this class of objects other than as whetstones should not be overlooked. The fortunate discovery of the faceted hematite stone associated with the grooved silt stone suggests that other similarly grooved stones may also have been used in the reduction of paints.

Pecking stones and hammer stones.—One large burned sandstone cobble found in the mound fill (square N10E1) shows evidence of battering on the ends, which may indicate its former use as a hammer stone. Feature 7 yielded one interesting sandstone pebble with a pestlelike shape. It is 11.7 cm. long, 3.5 cm. thick, and has somewhat pointed ends. Indications of wear by abrasion and attrition are not very conspicuously marked on this specimen.

These stones are listed by Webb and Snow (1945, pp. 88, 89) as Adena trait No. 126.

Faceted hermatite stones.—Forty pieces of worked and faceted hematite stones were found in eight of the mound features. These specimens are identified by provenience and are described as follows:

Feature 25.—Two faceted lumps of hematite.

Feature 35.—One roughly worked piece of hematite, two irregularly faceted lumps, and one oblong-faceted piece of hematite. The latter was found in one of the grooves of a whetstone.

Feature 37.—One angular-faceted lump of hematite.

Feature 41.—Sixteen angular and irregular pieces of hematite, all showing usage on one or more surfaces in weak to moderate amounts.

Feature 43.—Eleven angular fragments of hematite showing slight to moderate wear by rubbing and three lumps of ferruginous stone which have been battered and worn by attrition.

Feature 44.—One faceted piece of hematite.

Feature 46.—One faceted chunk of hematite.

Feature 48.—One faceted piece of hematite.

Inspection reveals that these ferruginous stone fragments may be roughly grouped into four categories, depending on the amount and kind of usage. Two of the more heavily rubbed stones are illustrated (pl. 27 *f*, *m*).[19] The next in order (pl. 27*o*), are angular specimens showing heavy rubbing on only one side. Rectangular chunks of hematite with fair to moderate amounts of usage (pl. 27*p*) are followed by irregular lumps (pl. 27*q*), which shows marks of hammer blows. One specimen (not illustrated) seems to have been blocked out as a hemisphere.

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[18] These tablets should not be confused with engraved tablets (Webb and Snow, 1945, pp. 91–96).

These faceted and battered hematite stones were undoubtedly used for the derivation of powder for paint. Mention already has been made of the oblong-faceted stone found directly associated with a grooved silt stone. Hematite hemispheres, which are well-finished objects, are apparently in a class by themselves, and should not be included in the same category as these purely utilitarian rubbing stones. The latter are certainly not as specialized in form as the hemispheres, which may have been nonutilitarian in function, although this cannot be proved.

As a matter of cursory interest, these ferruginous stone objects fall well within the range of Moorehead's (1912, p. 69, fig. 1) distribution of hematite artifacts. Triangular and irregular fragments of worked hematite are generally found throughout the Ohio Valley. Hematite does not appear to be an abundant trait of the Hopewell culture, as pointed out by Moorehead (1912, p. 92). Webb and Snow (1945) do not mention these artifacts anywhere in their list of Adena traits other than referring to the hematite hemispheres (ibid., p. 89).

Cupstones.—One limonite cupstone (pl. 27*r*) was recovered in feature 46. This specimen is of natural origin, with no observable marks other than a slight smoothing of the lip to indicate further adaptation. Other naturally formed stones of ferruginous origin were recovered in features 4, 48, and 50.

CHIPPED STONE

In the chipped-stone category, there are 263 whole and fragmentary specimens, including 218 blades or knives, 31 projectile points, 13 drills, and 1 scraper. All except 12 of these artifacts were found in association with the various mound features. The materials range in color from a light-tan chert through degrees of browns, grays, and greens to black. The typical material represented is a rather dull, light-tan-colored chert.

Knives or blades.—The workmanship of this group seems to fall into two categories of finish and flaking perfection. The preponderant number, probably blanks, seem to have been almost carelessly chipped with no especial excellence to be noted. A minority of the blades, the larger ones, exhibit more perfection and care in the chipping technique.

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[19] Plate 27, figures *m*, *n*, illustrates the obverse and reverse sides of the same object.

The greater majority of the former blades appear to be almost uniform in shape, size, and material. Even the workmanship has a degree of sameness about it. A cache of 109 blades recovered from feature 21 is an example. Apparently they were manufactured, perhaps in haste, solely for the occasion, since the primary and secondary flaking is of an unusually crude quality (pl. 28 *h*, *j–o*). The under side of many of the cruder specimens exhibits the curvature and imperfections of the original spall.

Four types of bases may be differentiated among the blades, serving as distinguishing criteria for comparison purposes. The type bases are: (*1*) The round or ovate base, which gives the blade a leaf-shape or ovate appearance (pl. 28 *a–j*, *n*, *o*), (*2*) the flat base which gives the blade a trianguloid effect (pl. 28 *k–m*), (*3*) blades with flat-based, straight-sided stems (pl. 28 *p*, *q*), and (*4*) blades with round or ovate-based stems (pl. 28 *r–w*). An examination of blade types discloses that 139 of the total have rounded bases or an oval-leaf shape. In decreasing frequency there are 57 flat-based or trianguloid-shape blades, 9 flat-based stemmed blades, and 8 round or ovate-based stemmed blades. Fragmentary specimens such as midsections naturally could not be included in this typological analysis.

The blades range in length from 6.8 to 22 cm. (pl. 28*u*). The average length is closer to the lower figure, between 9 or 10 cm. long. Thirty-eight blades are over 12 cm. long, and of these, 14 are about 14 cm. in length (the latter blades occurred in one cache in feature 22). Maximum blade breadths vary from 2.5 to 5 cm., with an average close to 4 cm. wide. They are lenticular in cross section, ranging from 0.6 to 1.4 cm. thick, with an average of about 1.0 cm. thickness.

As noted in the descriptions of the mound features, many of the associated blades and knives show evidence of having been subjected to fire. Physical changes resulting from the burning are shown by some discoloration of the specimens, such as chalky areas on an otherwise tough brittle surface, and surface patches of black tarlike organic matter up to 0.1 cm. thick. This latter substance is characterized by a series of linear impressions like that left by bark or similar material, perhaps part of a covering. Several of the blades have been fractured, evidently by intense heat.

Blades were found heavily coated with red ochre in three features (features 4, 22, 25). In feature 4 these artifacts were lying in such a thick deposit of red ochre that it had to be brushed away in order to expose the blades.

Leaf-shape blades or knives are very abundant in the Adena complex and blade caches are not out of the ordinary (Webb and Snow, 1945, pp. 82–83). Leaf- or ovate-shape blades are most common at Natrium, which conforms with a typical Adena trait. It is interesting to compare the large group of blades found at Beech Bottom Mound with the Natrium Mound specimens. Representatives of every one of the blades illustrated in the Beech Bottom report (Bache and Satterthwaite, 1930) may be found in the Natrium collection. In addition, there are some flaked specimens from the Natrium Mound which are not duplicated at Beech Bottom. The characteristic blade type at both sites is the leaf or ovate shape. However, the rounded-stemmed base blade, which is the second type in frequency at Beech Bottom, is poorly represented at Natrium. The trianguloid (flat-base type) blade is not represented at Beech Bottom. The significance of this is not known. The Beech Bottom Mound was only partially dug, which could allow for this difference in artifactual representation.

Projectile points.—There are 31 flaked artifacts classified as projectile points in the collection. Six specimens of the total are fragmentary or broken. With the exception of three projectile points, all were found in association with other aboriginal remains. Of the three specimens mentioned, one is fragmentary and the other (triangular) is of extremely crude workmanship.

The projectile points range in lengths from 3.6 cm. to 7.8 cm., the majority falling between 4.5 to 6.0 cm. long. In the order of their frequency, 27 of the points may be categorized in the following types: Flat-stemmed base, 17 (pl. 28*b′*–*f′*); ovate-stemmed base, 3 (pl. 28 *x*, *y*); side-notched stem, 2 (pl. 28*g′*); stem notched on one side, 2 (pl. 28*z*); ovate, 2 (pl. 28*a′*); triangular (crude), 1 (pl. 28*h′*). They are lenticular in cross section, averaging about 0.8 cm. at the maximum thickness. The crude triangular point and the points notched on one side are probably accidents of workmanship.

The material is of the same range of cherts used in the manufacture of the blades. The colors are dull, varying from light tan through browns and grays, to black.

There is nothing unusual in these types (disregarding the probable accidents of workmanship) since they are well represented in the Adena complex. The stemmed (parallel sides) projectile point is recognized as the most common Adena point. It is usually large and heavy.

Scrapers.—Only one stone scraper, associated with other goods in feature 20, was found in Natrium Mound. It is 6.3 cm. long and 2.4 cm. wide, and of light-colored chert similar to Flint Ridge flint. This specimen was originally a large flake with approximately parallel sides tapering toward the butt end. Inspection shows that the distal end was use-retouched. The scraper is somewhat discolored by traces of clinging red ochre which originally covered it.

This type of flaked implement is a common Adena trait.

Stone drills.—In the collection there are a total of 13 chipped-stone drills of which 5 are broken or fragmentary. The colors of these chert specimens range from light milky-pink to black. They range in length from 4.7 to 19.8 cm. The drills may be classified according to four distinctive base types, viz: (*1*) Flat base—4 specimens (pl. 28 *j′*, *l′*, *m′*); (*2*) pointed base—2 specimens (pl. 28 *n′*, *o′*); (*3*) rounded-stem base—1 specimen (pl. 28*k′*); (*4*) rounded base—1 specimen (pl. 28*i′*). With the exception of the two pointed-base specimens which are almost rhomboidal when viewed endwise, all the drills are lenticular in cross section.

Three of the drills show decided wear and polish from attrition to the point end. Presumably these drills were used for the boring of the tubular pipes and other stone objects.

Stone drills of the types described above may be duplicated from other Adena sites.

COPPER

Copper reel gorget or breastplate.—A copper reel-shaped gorget (pl. 25*a*) was found associated with a piece of woven fabric (pl. 25*b*) in feature 34. The textile remains were discovered under the gorget, preserved by the copper salts. It is described under the category, "Textile Remains."

The copper gorget is slightly convex with two holes bored near the center. The convex side was found facing upward. It is 14.2 by 10.1 cm. across the wings and averages a little over 0.1 cm. thick. The two center holes—0.4 cm. in diameter and 3.7 cm. apart—were drilled from the convex surface only. These holes do not show any wear at the edges, such as one would expect if the gorget had been suspended by the holes for any length of time.

Webb and Haag (1947, p. 100) list copper gorgets as a trait (No. 221) not heretofore acknowledged as belonging to Adena.

In the diagrammatic representation of the outline forms of the reels by Webb (1941, p. 208), this copper reel falls in the simplest category. It is likely that this particular reel shape was copied after the earlier stone pattern (Webb, 1941, pp. 213–215).

Copper beads.—All the 708 copper beads were found in strings associated with other remains in nine of the mound features. Frequently the string holding the beads together was preserved by the salts emanating from the copper. Some of the beads were badly corroded and cemented together. Occasionally a fragment of bone from a burial was also preserved in a feature otherwise barren of skeletal material.

On the basis of dimensional sizes, at least nine size types (pl. 25*e*, *upper*) may be segregated. As many as three bead sizes occurred in a feature. The beads ranged from 0.2 to 2.1 cm. in length and from 0.2

to 1.0 cm. in width (outside diameter). The holes ranged from 0.1 cm. in diameter to 0.5 cm. The largest and heaviest beads recovered were found in feature 34, represented by 60 beads of a string of 169. These beads were quite thick and solid with somewhat bulged sides. They average 1.0 cm. wide with holes of 0.5 cm. in inside diameter, and 0.6 cm. in length. The smallest beads were recovered in a string of 61 beads from feature 38. These average 0.2 cm. wide with holes of 0.1 cm. in diameter. They were 0.2 cm. in length. With the exception of some long beads, the rest of these artifacts range between these extremes, width and length matching within 0.1 cm. and the wall thickness measuring from 0.05 to 0.1 cm. The exceptional beads mentioned are from a string of long beads recovered from feature 41. They are 2.1 cm. long, with an outside diameter of 0.65 cm. and a hole diameter of 0.4 cm. The ends, viewed in cross section, are well overlapped; the sides are flat and the orifices are oblong or somewhat squared.

The copper beads in the Natrium collection show as much as a quarter circumference of overlap. Each bead apparently had been smoothed and the rough edges had been ground down. As a final touch, the beads were placed on an anvil with the hole flat and beaten just enough to bulge the sides. Naturally, since the aboriginal copper worker did not have any stamp or die from which to blueprint and reproduce his bead, each of these had to be individually and painstakingly manufactured.

Webb and Snow (1945, pp. 99–100), who list copper beads as Adena trait No. 181, claim that sheet copper was rolled into hollow cylinders and cut into varying bead lengths from "0.25 inch to 1.5 inches." Presumably the bead sections were cut with stone saws, evidence of which was not found in the mound. While this process of manufacture from large, rolled sheets may have been used in some cases, the writer, after a study of the Natrium beads, is inclined to accept Bache and Satterthwaite's (1930, p. 14) assumption that in this case the beads were made ". . . by rolling strips of thin copper of the desired size."

The copper beads, according to a sample study made by Dr. George Ellinger of the National Bureau of Standards,[20] were not cold-worked as commonly supposed. They were manufactured over a range of moderately elevated temperatures, as indicated by metallographic and metallurgical study. That the archeologist will have to reorient his thinking about primitive American copper work is a conclusion also drawn previously by Wilson and Sayre (1935, pp. 109–112).

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[20] Dr. Ellinger's report is given in Appendix 2.

MISCELLANEOUS

Beads:

Bone beads.—Bone beads, relatively scarce in the Adena complex, are represented from Natrium Mound by a string of 33 disk beads (pl. 25*c*) recovered from across the knees of a burial in feature 46. These beads, very crumbly and poorly preserved, were made of flat, smoothed bone, presumably of mammal. The average bead is 1.6 cm. in diameter and 0.3 cm. thick. The circumferences are not perfectly circular, and the thicknesses range between 0.2 and 0.4 cm. The holes, which are often slightly ovoid in shape, appear to have been bored from both sides. Their diameters are slightly over 0.4 cm. and less than 0.5 cm.

Bone beads are an Adena trait (No. 160) according to Webb and Snow (1945, p. 96).

Pearl and shell beads.—Thirty-six pearl and two shell beads were found draped over a Natrium Mound burial (feature 40). These beads are represented by six dimensional sizes as listed below. All were drilled from both sides. These beads were strung on the same cord with copper beads (pl. 25*e*, *lower*). The copper salts from the latter stained the outer surfaces of these beads.

TABLE 1.—*Beads from a Natrium Mound burial*

Number of beads	Outside diameter	Diameter of holes	Thickness or median length
	Cm.	*Cm.*	*Cm.*
3	0.9	0.4	0.8
10	.8	.3	.6
6	.8	.4	.4
12	.5	.2	.5
5	.4	.25	.45
2	.7	.4	2.4
38			

The first five dimensional sizes of beads, round and flattened-round beads, were apparently made from fresh-water *Unio* pearls. They present a range of diameters from 0.4 to 0.9 cm. with a thickness of 0.4 to 0.8 cm. The last group of 2 beads of the tubular type were made from the columella of large, unidentified marine gastropod shells. All the beads are fair in preservation, although a few are badly exfoliated and partially disintegrated.

Pearl beads are quite rare in the Adena complex. Columnar or tubular shell beads made from the columella of large gastropods are more frequently encountered in burial associations (Webb and Snow, 1945, p. 99).

Barite bead.—One barite bead (pl. 25*d*) was recovered from feature 51. This bead is a flat circular disk perforated from both sides. Its diameter is 1.7 cm. It is of uneven thickness, varying between extremes of 0.2 and 0.7 cm. The hole, imperfectly drilled and centered, is 0.5 cm. in diameter. Barite beads are apparently a new Adena trait, although Webb and Snow (1945, p. 90, trait No. 136) note that there have been aboriginal attempts to make beads of barite.

Worked bones.—A fragment 10.3 cm. long and 2.4 cm. wide of worked mammal bone was found associated with feature 46, a burial. This piece, 0.6 cm. thick, is plano-convex in cross section. Both ends of this object have been broken. One end narrows somewhat, as though for a point. Despite the checks and condition of poor preservation, it is evident that the bone had been well finished, judging from the polish on the surfaces. There is a small area of red ochrelike stain on the flat undersurface. An over-all patchy discoloration of black matter is also present. The origin of the latter was not ascertained.

Another worked-bone artifact, represented by a small handful of extremely brittle bone fragments, was found in association with feature 35, a burial. Three sections of the specimen total 10 cm. in length when pieced together. Two fragments show polish. Since the condition of the specimen is so fragmentary, there is some question regarding its form and probable use.

Bear canine tooth.—One fragmentary bear canine tooth was found associated with a cache of blades in feature 21. This tooth fragment, a little over 2 cm. long, represents the crown only. Unfortunately, no evidence of work can be discerned on it. However, its presence is significant since Webb and Snow (1945, p. 334) claim that no perforated or cut animal teeth are found in the Adena complex.

Worked coal.—A rectangular piece of hard coal, 1.5 by 1.3 by 0.4 cm., was found in the center of one of the bead strings associated with a copper reel in feature 34 (fig. 24*h*). The coal seems to have been carefully trimmed. There was no way of determining exactly how this object could have been tied to the string of copper beads, since holes for suspension or other indications of fastening are absent.

White pebbles.—Sixty-eight white quartz pebbles were found associated with a burial in feature 47. These pebbles were found in a little area about 1½ inches in diameter, as though they had been contained in a bag. The pebbles do not appear to be of any distinctive kind, being very similar to those gathered on any beach or stream bank. With the exception of two larger pebbles, they measure about 0.9 cm. long with proportionate widths and thicknesses. The two larger pebbles are 2.0 cm. long. It is highly probable that these pebbles may have been contained in a bag of some kind as had been mentioned, or perhaps in some more solid container equally vulnerable to decay. William C. Mills (1916, pp. 366–369) reports the finding of pebbles about the same size, which were recovered in the hollow of copper boatstones and copper cones at Tremper Mound. The use of the pebbles is problematical. They may have formed part of a set of appurtenances, such as fetishes, for promoting the personal welfare of the owner.

Natural sandstone pendant.—A single-holed flat, ovate stone was found unassociated in the mound fill. This specimen is quite smooth and lacking in sharp and abrupt edges, as though it had been water-worn. A hole, 1.1 cm. wide, was perforated from one side only, tapering to a diameter of 0.9 cm. on the reverse side. There is some doubt regarding the origin of the hole, since its inner dimensions are slightly belled out, a phenomenon not usually encountered in drilled holes. Even the striae one normally finds in drilled holes are absent. Considering this piece of sandstone from all points, it appears that it may have been a naturally perforated, water-worn pebble which either may have attracted the curiosity of the mound builder or was casually included in the mound fill.

Pottery.—Fragments of what were originally two small sherds identified by James B. Griffin [21] as Fayette Thick ware were found in square N13E2 at an elevation of 2.2 feet from datum. These sherds were not associated with other artifacts or feature data, and may have been accidentally included in the mound fill. The pottery is reddish brown in color, 1.3 cm. thick, heavily tempered with coarse fragmentary stone particles and very friable. The outer surface bears cord-marked impressions while the inner surface shows a slight roughening. Griffin (*in* Webb and Snow, 1945, p. 244) suggests that Fayette Thick pottery, an Adena trait (ibid., p. 102, No. 200), may be equated with an early manifestation of the Adena complex.

Pottery, odd fragments.—A small fillet of grit-tempered pottery was found in the excavation spoils. This fillet, 2.5 cm. long, was evidently finger-modeled. It is dark red in color, rather coarse in texture, and does not seem to have been subjected to firing, judging by its softness.

Another larger piece of hand-modeled light-brown clay, fashioned into an oblong shape, was found in the mound fill. It is unfired and coarsely sand-tempered. The specimen is 6.0 cm. long, 3.5 cm. wide, and 2.0 cm. thick. The surfaces which have not been broken or otherwise eroded are rudely smoothed as though this artifact had been consciously modeled into shape. Since this object was found in the mound fill, nothing definite can be said concerning it, except that it seems to belong to the class of so-called Poverty Point type problematical clay objects found to range in time from Tchefuncte to the Coles Creek stage in Louisiana (Ford and Quimby, 1945, pp. 31–32). These, however, were fired.

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[21] Director, Museum of Anthropology, University of Michigan, Ann Arbor, Mich.

Shells.—One large piece of shell was found in feature 46. This shell is a fresh-water mussel shell of local origin.

Several other fragments of local fresh-water mussel shells were found in mound features and in the mound fill.

These shells may have been worked, although they are so fragmentary that certain identification cannot be made.

Textile remains.—One solitary fragment of woven textile (pl. 25*b*) was preserved by the copper salts from a copper gorget found in feature 34. This bit of fabric, 8 by 12 cm., presumably the remnant of a larger example of textile art, lay under the gorget, assuming the outline shape of the latter in its preservation. The warp and weft cords are both distinct enough to make the identification of the weave. The warp cord was the poorer preserved of the two cords. The type of weave is called "plain twining" according to Miner (1936, p. 186, fig. 3) and "single twined weave" according to Webb and Funkhouser (1931, p. 383, fig. 84). It is a very simple weave. Single heavy warp cords are held in parallel position by lighter paired weft cords which pass at right angles to the warp, one cord on either side. The warp cords are bound close together by the weft cords, which in this example are 0.3 cm. apart from center to center. The weft cord, a little less than 0.1 cm. in diameter, is composed of two strands which are twisted in a clockwise direction. The coarser warp cord, about 0.15 cm. in diameter, seems to have been made from one strand twisted slightly in a counterclockwise direction. The weft cord is the stronger and more flexible of the two cords. This pliant cord may have been made from the silky fibers of a species of milkweed (Carey, *in* Webb, 1941, p. 187), although this is purely conjectural thinking, since no analysis of the cord was made. The coarser structure of the warp strands indicates that another kind of material was used, although it is also unidentified.

There is a small 3-by-6-cm. patch or impression of light furlike material extending along the width edge of this piece of textile. It is of parchment thinness. It may have been a bit of the hide of some small furred mammal.

One of the cords of the heavier copper beads is especially noteworthy, since it represents a deviation from the commoner cordage type found at Natrium Mound. It is composed of two strands of vegetal material twisted together in a counterclockwise direction, forming a cord 0.15 cm. thick. A third single strand (0.10 cm. thick) of the same fibrous material is wound around the heavier cord in a clockwise direction. The strands of the cord are twisted approximately five turns to the centimeter, while the single outside strand is wound approximately one and a half turns to the centimeter.

Fragments of cords of another kind of material were found preserved by the copper beads. These cords, up to approximately 0.4 cm. thick, appear to have been made of single strips of hide, laterally compressed and rolled to form rounded thongs. The identification of the cord substance is not certain, since unfortunately it has not been analyzed by a specialist at this writing.

SUMMARY OF THE ARTIFACTS

Some of the artifacts are especially significant since they represent new classes of objects to be added to the material trait list of the Adena complex. This seems to be the first recorded instance of an effigy birdstone from an Adena mound. True excavated boatstones were also not heretofore recorded for Adena. Several of the recovered objects are rarely mentioned for this culture, such as pearl beads and the copper reel gorget. For a mound of this size, there appeared to be a comparative wealth of artifactual remains.

An unusual number of celts and hemispheres were recovered. The celts, of which a good proportion were of hematite, were largely of the rectangular or oblong-poll type, in contrast to the rounded "pole end" celts more commonly found on Adena village sites. The majority of the hemispheres were of hematite of which one had a concavity on the flat surface.

Three tubular pipes and one modified tubular pipe were recovered, which strengthen the cultural link probabilities and possible temporal coincidence of Natrium Mound with an early Hopewell culture (Tremper Mound in Ohio), as Webb and Haag (1947, p. 93) have similarly suggested for the Fisher site. There are indications that the tubular pipes were smoking pipes.

Of note also is the grooved silt-stone tablet which was found in direct association with an oblong piece of faceted hematite. This poses another more probable usage of these grooved tablets which have been commonly called whetstones, bone awl sharpeners, etc.

Metallurgical analysis of one of the copper beads shows that a kind of metallurgy was practiced by the prehistoric Indians at Natrium. The metal was worked hot which runs counter to common supposition.

In comparing the "selected developmental traits" from Natrium Mound with Webb's (Webb and Snow, 1945, p. 213) chronological bar chart, it is seen that eight of the Natrium Mound material culture traits cover a wide span ranging from early Adena to middle Hopewell. Two traits (grooved axes and flat subrectangular stone celts) are listed as artifacts of early Adena; cones, reels of stone and copper, are listed as artifacts of early Hopewell and Adena; and three traits, including a bear canine tooth, use of copper objects and effigy atlatl weights, are categorized as artifacts of middle Hopewell. Tubular pipes are also listed as early Adena artifacts, but they are of the constricted mouth-piece type, while the Natrium Mound specimens are of the blocked-end type. However, considering the total assemblage, as exemplified by the Fortney Mound on the same chart, Natrium Mound is certainly an Adena site. There is a lack of the more typically Hopewellian traits, such as ear spools, obsidian, human effigies, mica, etc.

Likewise, the finding of cones and boatstones on the Fisher site (Webb and Haag, 1947, pp. 88–89),[22] like the stone pipes, points to probable contemporaneity of Natrium Mound with this late Adena site and to possible close cultural association with the Tremper Mound, an early Hopewell site.

In short, so far as can be ascertained from the artifacts themselves, following the established precedent of comparing link traits and associations, we must deduce from the evidence that Natrium Mound is a late temporal manifestation of the Adena culture.

SUMMARY

The following trait list summarizes, in tabular form, the Adena cultural traits [23] for Natrium Mound. These traits have been mentioned above in the course of describing the explorations, features, and artifacts. The place of their occurrence in the mound is given following the trait item.

Seventy-four of the traits correspond, in general, to those already published. Natrium Mound has contributed 11 new traits which have been provisionally appended to the list. It is evident that Webb and Haag (1947), in adding new material to the rather comprehensive tabulation drawn up by Webb and Snow (1945), realized that the addition of new traits to an already compiled and classified list complicated it. It is to be expected that at some future time these additional data will have to be incorporated under their rightful places in the various subheadings of the Adena summary.

ADENA TRAIT LIST, NATRIUM MOUND

MOUND AND BURIAL TRAITS

No.

7. Mound conical.
9. Mound in circular enclosure.
13. Mound shows stratigraphy.
14. Primary mound contains midden.
15. Secondary and later sections of mound built of sterile gravelly earth.
18. Mound shows individual loads of earth.

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[22] It is suggested by Webb and Haag (1947) that boatstones have an origin earlier than Adena.

[23] Compiled from the trait list for the Adena complex drawn up by Webb and Snow (1945) and Webb and Haag (1947).

No.
21. Fired areas on mound surface.
22. Primary purpose of mound to cover burials.
23. Mound built by increments as burials were added.
24. Constructional(?) use of stone. Feature 8.
25. Horizontal log tombs built on bark-covered clay floor. Feature 43(?).
26. Single log rectangle about body. Features 41(?), 43.
37. Subfloor pit dug below earth surface. Feature 28.
38. Earth embankment around subfloor pit. Feature 28.
40. Mound erected over subfloor pit.
54. Circular fire basins.
55. Fire basins with burned stones. Features 13, 19, 46.
63. Cremations, total, left in situ. Features 37, 44.
70. Cremated remains redeposited with burials. Features 34, 40, 46.
72. Communal deposit of cremated remains. Feature 37.
73. Artifacts burned with the body. Features 21(?), 32, 41, 44, 46(?).
74. Unburned artifacts placed with redeposited cremations.
75. Artifacts intentionally mutilated(?) when deposited with cremations. Features 21, 46.
76. Cremated remains accompanied by red ochre. Features 37, 40, 44.
77. Body extended burial. Features 45, 48, 50.
79. Body extended in log tomb, singly. Feature 43.
81. Multiple extended burials in same grave. Features 33, 35, 46.
82. Important central graves. Feature 28(?).
83. Use of bark in graves. Features 5, 34, 40, 41, 46.
84. Use of puddled clay in graves. Feature 49.
85. Red ochre on skeleton(?). Feature 46.
86. Red ochre, lumps or granules in mound. Features 7, 12, 14, 15, 21, 22, 25, 26, 28, 34, 35, 37, 38, 40, 41, 43, 44, 46, 49.
87. Red ochre on artifacts. Features 4, 22, 25, 49.
89. Graphite in graves. Features 20, 46.
92. Burial of isolated skull. Features 32, 36, 51.
96. Skeletons bundled. Features 39, 42, 47, 49.

ARTIFACT TRAITS

97. Blanks, flint. Features 25, 34, 41, 43, unassociated find.
98. Celts, flint. Feature 51.
101. Leaf-shaped blades or knives. Features 4, 12(?), 20, 21, 34, 35, 40, 41, 43, 51, unassociated finds.
102. Leaf-shaped blades deposited in cache. Features 4, 17, 21, 22, 32, 40.
103. Stemmed projectile points deposited in cache. Features 4, 25, 40.
104. Projectile points, stem with parallel sides. Features 4, 21, 25, 28, 34, 35, 41, 43, 51.
106. Projectile points, side notched. Features 20, 41.
107. Drills and reamers. Features 21, 35, 38, 40, 46, 51.
110. Scrapers, side, flint, flake. Feature 20.
112. Gorget, reel shaped. Unassociated find.
114. Gorget, semikeeled, rectangular base. Unassociated find.
115. Gorget, flat (triangular). Feature 25.
116. Gorgets conically perforated from one side only. Unassociated finds and Feature 21.
117. Pipes, tubular (blocked end). Features 43, 46.
122. Stone balls. Features 20, 46.

No.

123. Celts, granite and other igenous rock. Features 20, 25, 35, 40, 43, 44, 46, 51.
124. Celts, hematite. Features 6, 20, 21, 35, 41, 43, 46, 49.
126. Hammerstones, flint concretions and sandstones. Features 38, 41, 46, 49, unassociated finds.
127. Abrading stones. Features 35, 40, 46.
130. Hemispheres, limestone, sandstone. Features 44, 46.
131. Hemispheres, barite. Feature 46.
132. Hemispheres, hematite. Features 20, 21, 25, 40, 43.
134. Pestle (?). Feature 7.
137. Concretions or fossils. Unassociated finds, Feature 4.
139. Geodes, cuplike. Features 4, 46, 48, 50.
142. Tablets, rectangular (see trait No. 229).
160. Beads, bone. Feature 46.
163. Teeth, animal. Feature 21.
167. Spatula, flat bone sections. Features 35, 46.
173. Shell spoons (?). Features 12, 20, 35, 46.
177. Pearl beads. Feature 40.
178. Cylindrical shell beads. Feature 40.
181. Beads, rolled copper. Features 5, 15, 16, 22, 32, 34, 38, 40, 41. 46, 49.
200. Fayette Thick pottery. Unassociated find.
210. Plain twining (textile). Feature 34.
219. Pipe, modified tubular. Feature 41.
221. Copper gorget or breastplate. Feature 34.
229. Whetstones, sandstone (see also trait No. 142). Features 7, 32, 35, 40, 46, 43.

NEW ARTIFACT TRAITS

The following artifact traits recovered from Natrium Mound were not heretofore listed as Adena traits. They are provisionally added to the end of Webb and Haag's (1947, p. 100) list. New mound and burial traits are also included.

Three-quarter grooved ax. Feature 49.
Boatstone, perforated and excavated. Feature 21.
Birdstone. Feature 44.
Barite bead. Feature 51.
Worked-coal object. Feature 34.
White quartz pebbles associated in burial. Feature 47.
Battered or faceted lumps and pieces of hematite. Features 25, 32, 35, 37, 41, 43, 44, 46, 48.
Deposit of manganese dioxide. Feature 44.
Zoomorphic figure. Feature 34.
Pellet in tubular pipe. Features 43, 46.
Mound situated on terrace not subject to overflow.

Naturally the traits enumerated above are only representative of the burial complex, since there were certainly hosts of other more destructible items now lost to us. The burial complex, in turn, can be only selectively representative of the total cultural complex.

CONCLUSION

This mound is but one of the many tumuli originally found on the West Virginia side of the Ohio River. It is feared that with the increasing encroachment of industry on the shores of this river, the remaining evidences of aboriginal occupation will be destroyed there. Unfortunately our record of aboriginal earthworks in West Virginia, like the rest of the archeological record in the State, is very meager and wanting in detail. None of the earthworks recorded by Cyrus Thomas (1894) for West Virginia comprise an adequate fount of information. They are characterized by terse and brief comments which only serve to whet the appetite of the research worker and interested student. In truth, many of the earthworks described in the nineteenth century seem scarcely to deserve the distinction of being even partly explored.[24] Even if the data from Natrium Mound were unimportant, we could at least remark that these data, as well as the exploration, were reasonably complete.

Natrium Mound was on one of the greatest highways in the East, the Ohio River. The latter offered to the prehistoric aborigines an easy route of access into the more distant regions. Webb recognizes two centers of Adena occupation, the main concentration on the Scioto River in lower Ohio and the other, the lesser known, on the Kanawha River near Charleston, W. Va. (Webb and Snow, 1945). There seems to have been another concentration, albeit a minor one if the body of evidence is conclusive, at Moundsville or Grave Creek in West Virginia. Some 47 tumuli and evidences of an earthen wall have been located there by De Hass (n. d.) and Hennen (1909, p. 12).

On the basis of the evidence, Natrium Mound represents a single cultural occupation. The few unassociated finds (pottery, gorgets, etc.) in the mound fill do not represent strong exceptions to this statement. Grounding our evidence on comparative cultural traits, we deduce that this earthwork is related to the group of sites classified by Webb (Webb and Snow, 1945, p. 219) as late Adena. In this group are represented, among others, the Beech Bottom Mound, the Fortney Mound, the classic Adena Mound, and the Fisher site (Webb and Haag, 1947). Unfortunately, the aboriginal dwelling place at Natrium could not be located.

Webb (Webb and Snow, 1945, p. 219) asserts that there appear to be sites of both early and late Adena in Ohio and Kentucky, while West Virginia sites appear to be late Adena. To the hypothesis that West Virginia mound sites seem to be late in terms of Webb's analysis, we offer Natrium Mound as further corroboration. It sounds plausible to assume that Natrium Mound may have been a culturally peripheral structure, both figuratively and literally. A cultural lag seems to have carried it well into early Hopewell times. This is reflected in the presence of such Hopewellian traits as the birdstone and the excavated boatstone, occurring apparently contemporaneously with objects of patently Adena type. On the other hand, artifactual remains of what has been called early Adena type (e. g., flat subrectangular stone celts, grooved stones) are also included in the list of traits from Natrium. Granting that these may have been survival traits, we are confronted here with the fact that we have a curious assemblage of mixed items, all presumably within one temporal horizon. It is hoped that in the future we will be able to make further assessments of this problem with more archeological exploration of the upper Ohio drainage.

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[24] Natrium Mound and Beech Bottom Mound (Bache and Satterthwaite, 1930) are the only mounds in West Virginia described in the literature since Cyrus Thomas' (1894) work.

In terms of chronologies, Willey (1949, fig. 9) places the date of the Adena horizon roughly about A. D. 400 succeeded by Hopewell.[25] Natrium Mound represents a culture status (Burial Mound 1 Stage) that was midway between the first springings of an agricultural and ceramic-using aboriginal plane and one that was agricultural and ceramic-using of more complex cultural order.

Apparently the practice of erecting tumuli over the dead was already well established by the time Natrium Mound was built. We assume that the construction of such earthworks had a religious and ceremonial significance. The erection of burial mounds necessitated social cooperation and a dependable means of food supply necessary for a sedentary population. The varied disposition of the dead at Natrium Mound does not speak for any strict uniformity. This may have arisen from the possibility that modes of burial accorded the deceased differed with the place of the individual in his society. Even with the paucity of skeletal evidence, there are indications from the remains that the individuals represented must have been largely part of the adult population. The few remains that could be identified as to sex were male. The highly specialized burial equipage, including weapons of the hunt, warfare, and ceremonial objects, also strongly suggest masculine activities. We infer from this that there was probably some kind of social, religious, and/or military hierarchy among the Natrium Mound aborigines. Apparently such institutionalized practices were not out of the ordinary for people of the Adena culture.

The construction of Natrium Mound was undoubtedly premeditated and planned well in advance. Following the apparent stripping of the topsoil, there was laid down a stratum of yellow loamy earth. In the approximate center of the area was dug a subfloor pit over which a primary mound was erected. The latter contained the greater portion of the features found in the mound. One of the distinguishing criteria of this inner mound was the presence of gray-soil heaps of rather loose texture resembling mixed ash deposits. These deposits were invariably hummock-shaped in profile. They were conceivably the product of cremations and fires at the mound site. Over the top of the primary mound was added another heaping of earth, called in this report the secondary mound. The latter did not add much materially to our data, other than the inference that the soil seems to have been collected from immediately around the tumulus creating a kind of moat or ditch of appreciable width.

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[25] According to one of the findings of the recent carbon-14 tests (Arnold and Libby, 1951, pp. 114–115), the order of temporal sequence for Hopewell and Adena is reversed. Even with the high order of accuracy attained by these chronological tests (Arnold and Libby, 1949), an early Hopewell date preceding that of Adena is viewed with some skepticism by specialists in the light of what is known at present about Adena and Hopewell cultures.

No aboriginal earth quarries were observed in the near vicinity, although a portion of the present modern gravel pit could have been used. No noticeable rise in elevation was present at the site above the general terrace level which could have been taken advantage of in the erection of Natrium Mound. The latter was located on the terrace above the flood bottom, apparently in keeping with a recognized custom. The aborigines must have realized that the occasional river floods inundating the bottom terraces would have destroyed or damaged their funerary structures. This phenomenon of mound location on the second or third river terraces seems to be quite general. Cyrus Thomas (1894, p. 436) has made reference to this practice on the Kanawha River in West Virginia.

The excavation technique and equipment employed at Natrium Mound proved to be unusually satisfactory. The bulldozer, substituted for the horse and scoop shovel ordinarily used, was certainly the most expedient piece of equipment available. To carry on an excavation of this earthwork with only four regular workmen in the number of 20 days allotted for the job would certainly not have netted the results obtained by slower methods. Indeed, the time would surely have run out long before the completion of the excavation.

Once the features—of which 51 are recorded—were exposed, they were carefully examined, charted, and photographed. Particular attention was paid to changes in soil composition and soil samples were taken of each range of demarcation. Laboratory examination of the soil samples yielded pertinent information which otherwise would have gone undetected. Especially revealing were the analyses for the available bone phosphate, disclosing that there were more burials than originally accounted for by osseous material alone.

No elaborate structural tombs, or indications of post molds suggesting houses, were found. Although it was expected that there may have been post molds in the basal layer, the search for them proved fruitless.

Salvaged from the possibility of total loss to archeology, Natrium Mound represents a further contribution to our knowledge of the burial phase of the Adena culture. The archeological evidence presented in this report permits us to enlarge the scope of our understanding relative to what must have been a highly dynamic order of cultural change in the life of late Adena man.

APPENDIX 1

ANALYSES OF SOIL SAMPLES AND MINERAL MATERIALS

Soil samples.—Thirty soil samples from various parts of Natrium Mound were sent to the Department of Agriculture for examination and analysis. These samples were checked for the available phosphate present, the pH value, and the textural terminology as recognized by the soil specialists. The available phosphates tested for are the bone or calcium phosphates which were graded according to the amount present in each sample in five degrees of concentration. They were *very low*, *low*, *medium*, *high*, and *very high*. Since the preservation of artifactual and skeletal material depended, in large part, upon whether or not the soil was acid or basic (acid soil is a notoriously poor medium for the preservation of organic material), it was determined to get an analysis of the pH factor or the hydrogen ion value. Remembering that a pH value of 7.0 is neutral, values above this figure constitute a basic or alkaline medium, while values below pH 7.0 are acid. For the sake of uniformity, it was decided to have a soil expert's identification of the textural quality of the samples. The archeological importance of the analysis for bone phosphate has been demonstrated with great success in northern Europe (Clark, 1936, pp. 19–22).[26]

What appeared to be the more important featural data were sampled for soil analysis. All the red and yellow ochre, white lumps of material, and similar anomolous and extraordinary soils were saved for laboratory examination. These are more fully described later.

The whole of the mound fill was acidic to a moderate degree, ranging in hydrogen ion concentrations from values of pH 4.5 to pH 6.3. The general level of acidity falls closer to the lower figure, or higher acidity.[27] One check sample of sterile soil taken outside the mound at a depth of 3.0 feet below stake N2–0 gives a pH value of 5.6. It indicates *very low* in available phosphate. This soil had a loam texture.

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[26] The method depends on the fact that in areas of intense human settlement, the phosphate content of the soil, owing to the decay of discarded bones, tends to be considerably higher than in areas merely contiguous to such settlement, and much higher than in those areas completely beyond the bounds of settlement. It has been found, in fact, that the soil of an area of intensive settlement may contain easily as much as 50 times the proportion of phosphate as ordinary soil. There is a specific unit of testing for phosphate content called a phosphate degree which is equivalent to a yield of $\frac{1}{1000}$ percent of phosphate under the action of citric acid at a strength of 2 percent. The writer did not use this method of degree measurement, since he did not perform the tests himself.

Two Swedish scientists, O. Arrhenius (1930), who evolved the method, and Ivar Schnell (1932), who applied it successfully, are credited with introducing this technique to archeology.

[27] Attention is drawn to the fact that a solution with a pH of 4 is 10 times as acid as one with a pH of 5 and 100 times as acid as one with a pH of 6.

Three samples were taken of basal deposits in features 14, 28, and 43. All three were *very high* in phosphate content, the pH's being 4.5, 4.7, and 6.4, respectively. The soils were classified texturally as loam and silt loam. Only feature 43 in this group was a burial with observable skeletal material. The others were a lens of red burned earth (feature 14) and the central pit (feature 28). The test for phosphate would seem to indicate whether or not skeletal material had been present in a feature, making allowances for contamination from extraneous sources. Presumably features 14 and 28 also represent burials, shown by the very high amount of phosphate present, undoubtedly the result of disintegrated and decayed bones.

No doubt the majority of, if not all the rest of the features lacking skeletal material, were also burials. Frequently all that remained of the osseous matter in undoubted burials were a few bones fortuitously preserved by copper salts.

Gray-soil samples.—Encountered in the course of excavations were pockets and lenses of grayish soil which seemed to have been purposely deposited (fig. 19 *A*).

The soil color ranged from gray to light brown, and was quite loose or light-textured, unlike the more compact soil of the mound fill surrounding it. It had the characteristics of mixed ashes and loamy earth with some included pebbles. It was obviously not natural earth, such as that encountered in sterile soil zones.

Beginning at a depth of 4 feet from the top of the mound in the center, the gray soil was found occurring in a series of isolated and contiguous lenses down to base level. It capped several features (Nos. 20, 30, 34, 40, 41, 43). The greatest concentration lay in the eastern and northern areas. It is not known how much of the gray soil had been disturbed by Wells' intrusive excavation on the southern side of the mound. Although the demarcations between lenses could be distinguished since the gray soil was easily recognizable, the rapid nature of the exploration forestalled any attempts to follow them out at leisure. The largest body of gray soil observed covered feature 41. The soil was superimposed as a sort of blanket over a greater part of the yellow loam layer, the prepared basal layer of Natrium Mound. In no case did the loam lie above the gray soil. The latter soil, for some inexplicable reason, cut through the loam in a portion of the east-central part of the mound base.

Laboratory examination and analysis of four samples of gray soil showed that it was *very high* in available phosphate, indicating that it was heavily contaminated with this matter. All the specimen samples were acidic, the pH values ranging from a pH 6.0 to pH 4.7.

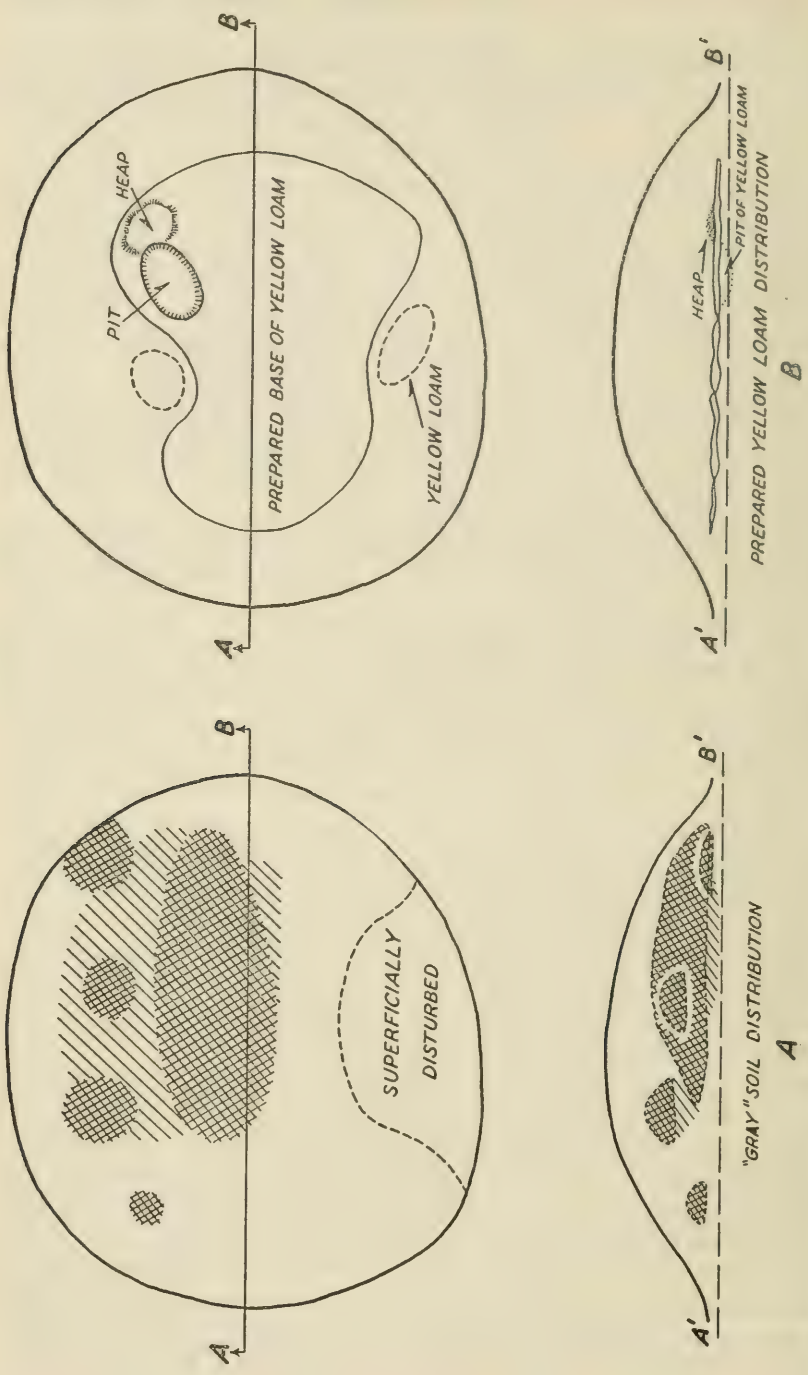
A
B
SUPERFICIALLY DISTURBED
A'
B'
"GRAY" SOIL DISTRIBUTION
A
A
B
HEAP
PIT
PREPARED BASE OF YELLOW LOAM
YELLOW LOAM
A'
B'
HEAP
PIT OF YELLOW LOAM
PREPARED YELLOW LOAM DISTRIBUTION
B

FIGURE 19.—The gray-soil and yellow-soil distribution in Natrium Mound.

The textures were those technically described as either coarse sandy loam, or coarse loamy sand. We infer from the high phosphate content that this soil probably may have been part of cremation hearth sweepings, or the product of some kind of combustion in which bony matter played a part. It is interesting to note that a sample of soil, not gray soil, found directly beneath one of the gray-soil layers, contained 1 degree less phosphate content (*high*) (pH 4.6). We may surmise that there was some natural percolation of mineral-bearing water in the mound. Root tendrils, which were plainly visible during the course of the excavation, probably had much to do with the course of the water's percolation.

The prepared mound base.—A layer of yellow soil (fig. 19 *B*), a kind of almost impervious sterile loam, was uncovered at the base of the mound, lying directly beneath the gray-soil bed and the dark soil. The yellow soil was most frequently associated with the gray soil. The former, like the latter, was intentionally deposited for some purpose by the aborigines. Apparently it had been brought to the spot from elsewhere, probably from the riverbank, since it did not occur naturally in the immediate vicinity. Almost claylike in composition, the yellow soil was mixed with a moderate amount of pebbles. This deposit, outlined in the course of the excavation, averaged about 8 inches thick. Its over-all thickness ranged from 6 to 10 inches with an extreme thickness of 2 feet in a pit. Its elevation above the datum line was approximately 1.3 feet, or ranging from 10 inches to 2 feet above datum. Viewed in ground plan, the bed, which occupied the central portion of the mound, was shaped like a constricted ovate, with two outliers of small lenses to the north and south of the main body. The latter measured about 40 by 35 feet, the longer measurement being on the E-W axis. There was an oval-shaped pocket of yellow loam 10 feet long and 5.5 feet wide in the northeast part of the mound. This pocket or pit, which was basin-shaped in vertical section, extended into the subsoil for a depth of 2 feet. There was a small heap of the same yellow soil 1.5 feet high to the immediate northeast of this pit. Underlying the prepared floor was sterile subsoil consisting of loose sandy and gravelly soil mixed with inclusions of black shale. This soil is evidently part of the Ohio River terrace gravels. No intervening layer of humus or sod was visible between the yellow soil and the subsoil. From this it may be inferred that the sod or humus was stripped from the mound area before the floor was laid down.

Laboratory examination indicates that the yellow loam (one sample) had a low phosphate content, and a pH of 4.5. It was texturally classed as coarse sandy loam. The fact that the loam lacks phosphate to any degree is not surprising, since it appears to be relatively pure and uncontaminated soil. The sterile and undisturbed gravelly soil beneath the loam layer had even a lesser amount of phosphate, or *very low* content according to analysis of one sample. It was classed as coarse loamy sand. Since clay soil such as the yellow loam is less permeable than a sand, it follows that the hardpan of yellow loam must have acted as a kind of hindrance to permeable solutions in the mound, sealing off the more permeable subsoil from the mound proper.

The reason for the occurrence of the pit and heap of yellow soil on the mound periphery, as noted above, is not certain. The soil was not naturally deposited, that much we are sure of. Vertical sections were carefully checked. It may be that the earth was dumped there originally, to be redeposited later over the mound area. Speculating further, the pit may have been a kind of mixing trough where the loam was made more plastic for the preparation.

MINERAL MATERIALS

Graphite.—Approximately three-quarters of a teacupful of black graphite granules was recovered from the mound (feature 46). These lumps vary from approximately 0.7 cm. in size to the consistency of powder. Another small patch of graphite occurred in feature 44. Graphite is one of the Adena traits (Webb and Snow, 1945, p. 79). The closest recorded instance of the occurrence of this mineral in a related Adena mound is at Beech Bottom, where graphite was found as small grains or pebbles, the largest diameters varying between 0.5 and 1.0 cm.

Manganese dioxide.—A small deposit of bluish matter and associated discolored earth, comprising about 2 tablespoonfuls, was recovered from square N9E2, feature 44. This bluish deposit, upon examination, proved to yield a manganese dioxide stain, apparently accounting for its color. The occurrence of manganese dioxide from other related mounds is not recorded to the writer's knowledge. Presumably this mineral was intentionally placed in association with other funerary material. It was probably a paint derivative.

Red and yellow ochre.—Red and yellow ochre were found in relatively great abundance in Natrium Mound. At least 18 pounds of red ochre, and about 6 ounces of yellow ochre were recovered from burials and other features. Red ochre seems to have been a favorite mineral among the Natrium Mound builders because traces as well as fairly large deposits were found throughout the tumulus. One of the heaviest deposits of this mineral was exposed in feature 4 (pl. 24*g*), where it covered a cache of flint blades.

Three samples of red ochre were tested from Natrium Mound by the soil specialists for phosphate content, acidity, and texture. The red ochre was found to be *very high* in phosphate content, on the acid side ranging from pH values of 4.5 to 6.3, and loamy in texture. It was not immediately determined by the analysis why the red ochre was so high in phosphate content. The possibility that it may have become contaminated from association with the phosphates of the feature should not be overlooked. However, in view of the fact that other small deposits of earth (yellow ochre and whitish matter), not red ochre, found in similar situations lacked such appreciable amounts of phosphates, leads to suspicion that the phosphate was an introduced ingredient.

The composition of ochres in their natural conditions include Fe_2O_3, Al_2O_3, SiO_2, H_2O, and small amounts of alkalies, but no phosphate. A significant statement by a geologist is:

> The term "red ochre" as commonly used applies to earthy and pulverulent forms of the minerals, hematite and limonite, but which are almost invariably more or less impure through the presence of other metallic oxides and argillaceous matter. In nature the material rarely occurs in a suitable condition for immediate use, but needs first to be prepared by washing and grinding, and perhaps roasting. (Merrill, 1905, p. 100.)

In addition, Merrill (1905) states that the colors of the ochres are dependent on the degree of hydration and oxidation of the material and the kind and amount of impurities. The colors are intensified or otherwise varied by roasting.

It is entirely plausible that the intense heat, as indicated by many of the features, probably contributed to color changes in the ochre. On the other hand, we are not sure whether or not the Adena people practiced ochre roasting consciously, introducing into the mixture other materials. The problem of red ochre should be elucidated further.

We know that the prehistoric Indians laboriously mined red and yellow ochre and white kaolin—at least we have one well-honeycombed mine on record near Leslie, Mo. (Holmes, 1919, pp. 266–270; Holmes *in* Moorehead, 1912, pp. 59–64).

A simple test was made by the writer to determine if red ochre could have been derived from hematite. Upon rubbing a small fragment of this stone upon a streak plate, it became obvious that the hematite streak, a dark brown color, was different from the color of the ochre, a bright red. This test was suggested by the recovery of grooved silt stones and faceted hematite stones in Natrium Mound. One particular grooved silt-stone artifact was found in situ with an oblong-faceted piece of hematite in one of the grooves (p. 341). It is entirely possible that the powder or hematite rubbings could have been converted to red ochre by roasting it, driving off the water content. Such necessary temperatures were well within the reach of the aborigine.

Yellow ochre is less commonly found on Adena sites than red ochre. A thickness of hard, lumpy, impure yellow-ochre material was found coating a grooved silt stone in feature 46. Other small deposits of the stuff were found in association with other features. Analysis of five samples of yellowish earth or yellow ochre reveals that they all lacked the high amount of phosphates found in the red ochre. Two of the analyses showed *very low*, two *low*, and one *medium* phosphate content. The texture was "coarse sandy loam" in three samples, and "loam" in two of the samples. The acidity ranged from values of pH 4.2 to pH 5.2 The yellow ochre seemed to be in its natural state, or, at least, naturally lacking in phosphates, except for a slight possible contamination.

It is evident from this brief appraisal that the question of the aboriginal usage of ochre, especially red ochre, should be studied at length in all its technical and chemical aspects. It seems apparent that we should no longer accept red ochre as a final entity in itself when describing it as a trait, but we should examine it critically in an effort to learn more about its nature and qualities. In this wise we may learn more about the people who used this pigment. It is very likely that there may be certain earmarks contained in the consistency of the ochre, such as the phosphate occurrence noted above, which may give us cultural information which we have heretofore unsuspected.

White powder deposits.—Some white powdery material was found partially coating a grooved silt stone (feature 40). This white deposit had a *very high* phosphate content and a pH of 4.7. It was classified as coarse loamy sand according to the soil experts. Another small deposit of white powder near some beads in feature 34 also had a *very high* phosphate content. It had a pH value of 6.1 and was classified texturally as coarse sandy loam.

However, not all white deposits appeared to be the same chemically. A white powdery deposit resembling ashes was discovered to the west of a flint in feature 34. This deposit had a *low* phosphate content and a pH value of 4.8. It was classified as coarse sandy loam. Another similarly textured lump of whitish material from feature 46 had a *very low* phosphate content with a pH value of 5.0. A white deposit from the same feature gave a *very high* test for phosphate. Some of the fragments showed cortical bone structure under magnification, adding conclusive proof.

The appearance of these deposits of white material in the mound suggested burned or cremated bones which were reduced to the end product, bone ash. Since bone ash is high in available bone phosphate, we can eliminate the two deposits containing little phosphate from this category at once. The first two of the deposits examined above, which are very high in phosphate, are probably cremation remains. The other two earthy materials may have been paint pigments of mineral origin.

CONCLUSIONS: SOILS AND MINERALS

The study of soils and minerals in relation to archeology is very illuminating, in that much can be learned to supplement the total picture of a prehistoric culture. In this regard, analysis for phosphate bears an especially interesting relationship. Positive evidence was found indicating that there were more burials in Natrium Mound than originally had been enumerated. The latter were based on skeletal evidence, some of which was exceedingly meager. Phosphate analysis, revealing very high concentrations of bone phosphate in apparently nonburial features, actually proved the usefulness of this check.

Wider applications of soil analysis for phosphate are foreseen, especially when there is doubt of whether osseous matter, specifically burials,[28] had been present in a given area or not.

The situation regarding the pH of the mound soils is less revealing. Other than that the average of the soil samples within the mound is slightly more acid than the soil outside the mound, the writer is not certain what deductions might be drawn. Cook and Treganza (1947, pp. 140–141) [29] who made a quantitative investigation of two aboriginal habitation mounds in California, have indicated that mounds containing a measurable amount of calcium carbonate give a basic reaction, such as one might guess. Natrium Mound, in the absence of shells and other lime-producing materials, was acid. The terrace on which this earthwork was situated is composed of an acid soil called Wheeling gravelly loam (Hennen, 1909, pp. 620–621).

Soil specialists (Kellogg, 1941, 1948) have shown that soil is an intimate part of our economy today and in the future, as much as it had been in the past. Needless to say, the latter also includes prehistoric civilizations as well. Application of the geochemistry of soil scientists, one phase of their study, can be profitably employed in conjunction with archeological studies. Undoubtedly many of the soil phenomena and factors of soil chemistry which perplex the archeologist, may be explained in terms of the soil scientist. The study of soils is already a thoroughly functioning study—there remains but the direct application of this knowledge to archeological work. The writer feels that the soil study made here is only an exploratory measure in the light of what can be done in future archeological soils research.

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[28] Naturally the check for bone phosphate does not show whether or not the results are nonhuman or human phosphates. However, one can reasonably expect that burial furniture will accompany a human interment, and that a burial mound will contain human remains.

[29] These authors made three types of analyses: For hydrogen ion concentration, for lime as $CaCO_3$, and for organic carbon. No phosphate analyses were made.

Some investigations have been made on human bones in the belief that chemical changes which take place in human burials in the soil may be utilized as a criterion for determining the age of the bone. Although the results of the experiments are encouraging, success of the methodology has not yet been complete (Cook and Heizer, 1947; Heizer and Cook, 1949).

APPENDIX 2

MICROSTRUCTURE OF COPPER BEAD FROM NATRIUM MOUND

"A copper bead from an ancient Indian burial mound at Natrium, West Virginia was badly corroded, the metal being less than 0.02 inches thick at any place. There was not enough metal for chemical analysis, but there was little evidence of oxide in the interior indicating that it probably was made from native copper. Two photomicrographs (pl. 29 *a*, *b*) show the grain structure on opposite sides of the bead. There is no significant difference in structure in the two areas. The bead was formed hot by hammering as indicated by a few twins and by the more or less equiaxed grains. The material was not annealed following hot working since the grains differ considerably in size. There is no evidence of any cold working. Several small discontinuities resembling cracks, one of which is shown in plate 29*b*, were observed in the bead. While these generally marked the boundaries of grains, they could not be pulled apart readily, indicating that they had been partly welded together. This would have been possible only in hot-worked material. These discontinuities probably resulted from the hammering of folds or overlaps in the original piece of copper from which the bead was made." (Report submitted by Dr. George Ellinger, National Bureau of Standards, Washington, D. C.)

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EXPLANATION OF PLATES

Plate 24

a, Natrium Mound at the start of the excavation.
b, First exploratory trench. The reference profile is at the right of the trench.
c, Test trenching the upper sector of the western side of the mound.
d, Cutting away of the overburden and backfill earth with a bulldozer.
e, Operations during a snowstorm.
f, Slicing below the base of the mound in the final stage.
g, Feature 4: Cache of chert blades covered with red ochre.
h, Feature 34: Copper breastplate and other artifacts associated with a burial. The bead strings in the lower group appear to be arranged in a zoomorphic pattern.
i, Feature 21: Part of a group of 109 chert blades and associated artifacts. The object above No. 1 is an excavated boatstone lying in situ.

Plate 25

a, Feature 34: Copper breastplate.
b, Feature 34: Textile directly associated with copper breastplate.
c, Feature 46: Disk beads of bone associated with a burial.
d, Feature 51: Disk bead of barite.
e, Copper and shell beads with associated cordage found in various features.
f, *g*, Feature 43: Tubular stone pipe and associated stone pellet.
h, Feature 46: Long stone tube pipe.
i, *j*, Feature 21: Two views of an excavated steatite boatstone found associated with a cache of blades.
k, Feature 41: Modified tubular sandstone pipe.

Plate 26

a, Unassociated find of slate reel-shaped gorget.
b, Feature 25: Slate pendant.
c, Unassociated find of slate, semikeel-shaped gorget.
d, Feature 44: Sandstone birdstone.
e, Feature 46: Round stone ball.
f, Feature 20: Round stone ball.
g, Feature 49: Three-quarter grooved stone ax.
h, Feature 44: Celt of diabase with deposit of white matter adhering to the upper surface. Semipointed poll.
i, Feature 46: Well-polished celt of green stone. Pointed poll.
j, Feature 46: Celt of diabase, two-thirds polished. Oblong poll.
k, Feature 25: Celt of diabase, one-quarter polished. Oblong poll.
l, Feature 43: Celt of diabase. Rounded poll.
m, Feature 43: Celt of diabase. Rounded poll.
n, Feature 43: Celt of diabase. Rounded poll.
o, Feature 43: Celt of diabase. Pointed poll.
p, Feature 25: Celt of diabase. Oblong poll.
q, Feature 20: Celt of diabase. Oblong poll. Thin coating of graphite adhering to the poll.

r, Feature 51: Celt made from a flaked blade. Oblong poll.
s, Feature 43: Hematite celt. Oblong poll.
t, Feature 46: Hematite celt. Oblong poll.
u, Feature 49: Hematite celt. Oblong poll.
v, Feature 46: Hematite celt. Oblong poll.
w, Feature 43: Hematite celt. Oblong poll.
x, Feature 43: Hematite celt. Oblong poll.
y, Feature 41: Hematite celt. Oblong poll.
z, Feature 6: Hematite celt. Pointed poll.
a′, Feature 21: Bit end of massive hematite celt associated with group of blades.

PLATE 27

a, Feature 35: Abrading or sinew stone.
b, Feature 46: Abrading or sinew stone.
c, *d*, *e*, Feature 46: Part of a group of honing stones found in a burial.
f, Feature 35: Grooved silt stone with associated piece of oblong, faceted hematite.
g, Feature 32: Grooved silt-stone tablet with deposit of burned organic matter on surface.
h, *i*, Feature 46: Two well-polished plano-convex barite hemispheres found together. Top and profile view.
j, Feature 46: Plano-convex limestone hemisphere with fragment of bone adhering to flat surface. Top view.
k, Feature 40: Plano-convex hematite hemisphere with hollow base. Profile view.
l, Feature 20: Plano-convex hematite hemisphere with flat base. Top view.
m, *n*, Feature 46: Two views of faceted piece of hematite showing heavy attrition.
o, Feature 41: Two worked pieces of hematite.
p, Feature 41: Part of a group of worked fragments of hematite.
q, Features 35 and 41: Group of hammered and faceted hematite stones.
r, Feature 46: Natural ferruginous cupstone showing aboriginal adaptation to use.

PLATE 28

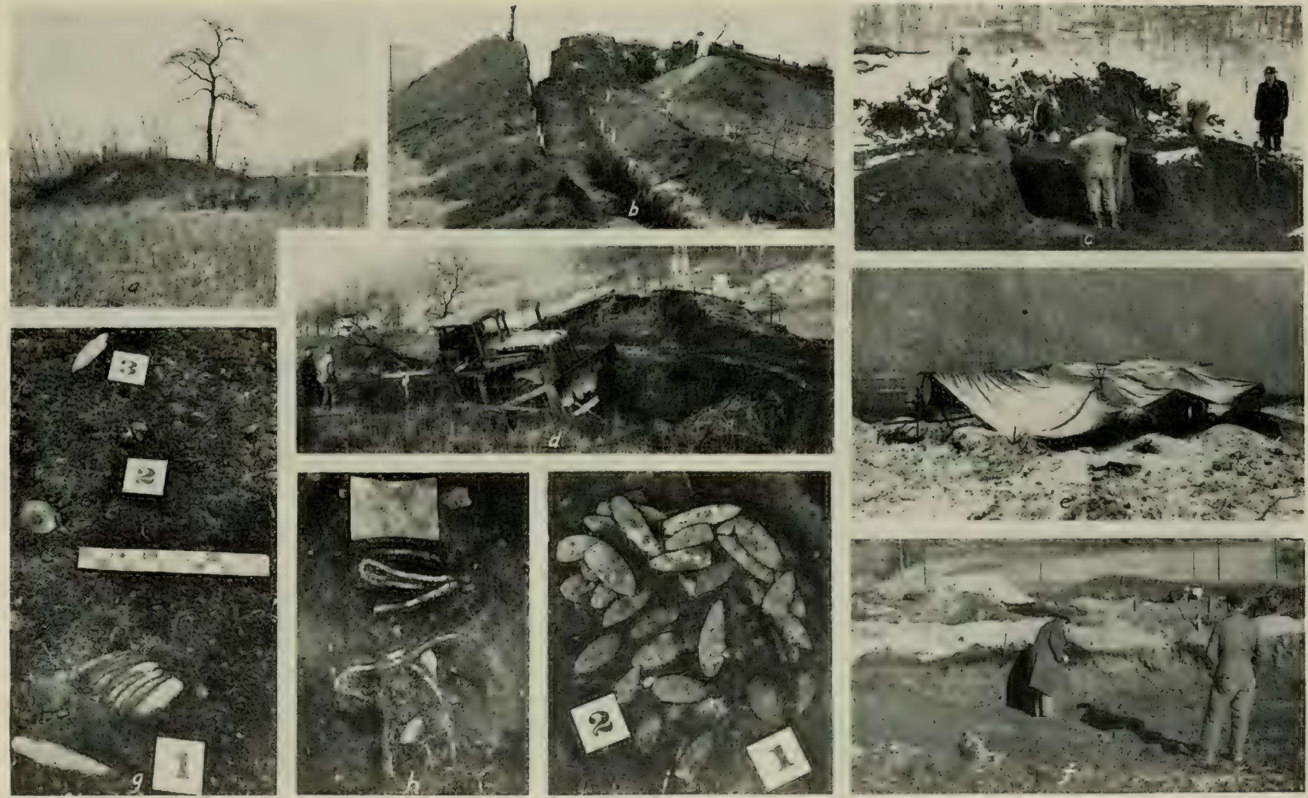
a, Feature 40: Leaf-shaped blade of light-gray chert.
b, Feature 40: Leaf-shaped blade of black chert.
c, Feature 22: Leaf-shaped blade of dark-gray chert.
d, Feature 22: Leaf-shaped blade of banded dark chert.
e, Feature 40: Leaf-shaped blade of light-gray chert.
f, Feature 22: Leaf-shaped blade of dark-gray chert.
g, Feature 22: Leaf-shaped blade of dark-gray chert.
h, Feature 21: Leaf-shaped blade of tan chert.
i, Feature 41: Leaf-shaped blade of gray chert.
j, Feature 21: Leaf-shaped blade of tan chert.
k, *l*, *m*, Feature 21: Trianguloid-shaped blades of tan chert.
n, *o*, Feature 21: Leaf-shaped blades of tan chert.
p, Feature 35: Flat-base, parallel-sided stemmed blade of dark chert.
q, Feature 21: Flat-base, parallel-sided stemmed blade of light-tan chert.
r, Feature 4: Round-base stemmed blade of dark-gray chert.
s, Feature 40: Round-base stemmed blade of pink chert.
t, Feature 40: Round-base stemmed blade of dark-green chert.
u, Feature 40: Round-base stemmed blade of light-green chert.
v, Feature 20: Round-base stemmed blade of gray chert.
w, Feature 40: Round-base stemmed blade of light-gray chert.

x, Feature 51: Projectile point of black chert with rounded stemmed base.
y, Feature 51: Projectile point of light-green chert with rounded stemmed base.
z, Feature 25: Projectile point of light-tan chert with one side notched.
a′, Feature 51: Projectile point of dark-green chert with ovate base.
b′, Feature 25: Projectile point of gray chert with flat-stemmed base.
c′, Feature 25: Projectile point of light-gray chert with flat-stemmed base.
d′, Feature 25: Projectile point of light grayish-tan chert with flat-stemmed base.
e′, Feature 25: Projectile point of grayish-tan chert with flat-stemmed base.
f′, Unassociated find: Projectile point of dark-gray chert with flat-stemmed base.
g′, Feature 41: Side-notched light-buff projectile point.
h′, Unassociated find: Crude triangular projectile point.
i′, Feature 40: Rounded-base drill showing polish from attrition on the point.
j′, Feature 46: Flat-base stemmed drill of light-tan chert.
k′, Feature 46: Rounded-base stemmed drill of light-tan chert.
l′, Feature 46: Flat-base stemmed drill of light-gray chert.
m′, Feature 46: Flat-base stemmed drill of light-tan chert.
n′, Feature 51: Pointed-base drill of dark chert.
o′, Feature 35: Pointed-base drill of dark chert.

PLATE 29

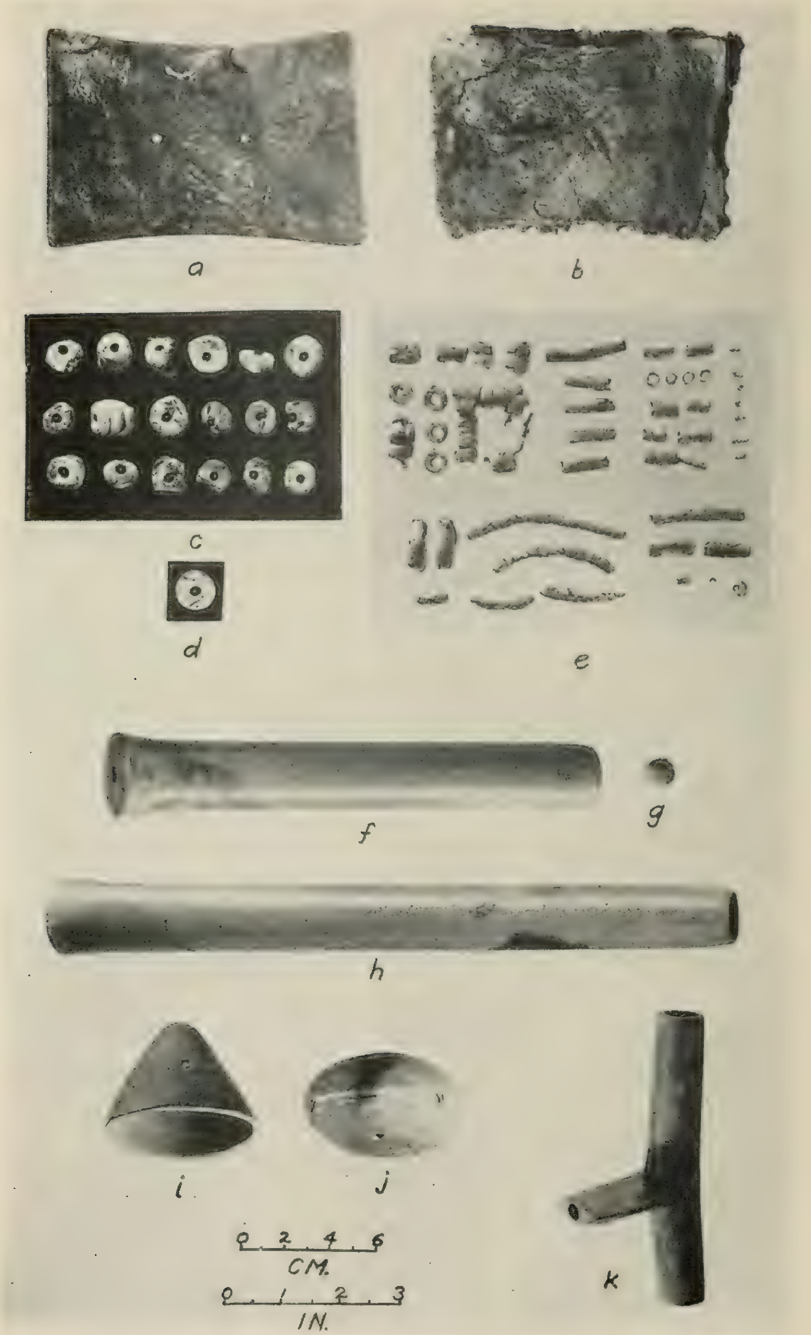
a, Miscrostructure of cross section of bead (× 100). The piece is badly corroded and is quite thin in places. There is no evidence of cold work.

b, Microstructure of cross section of bead opposite that shown in *a* (× 100). There are a few twins, the grains are generally equiaxed, and differ considerably in size. There is a discontinuity resembling a crack which has been partially welded together.



STAGES IN THE EXPLORATION OF NATRIUM MOUND AND REPRESENTATIVE MOUND FEATURES WITH ASSOCIATED ARTIFACTS.

(For explanation, see p. 393.)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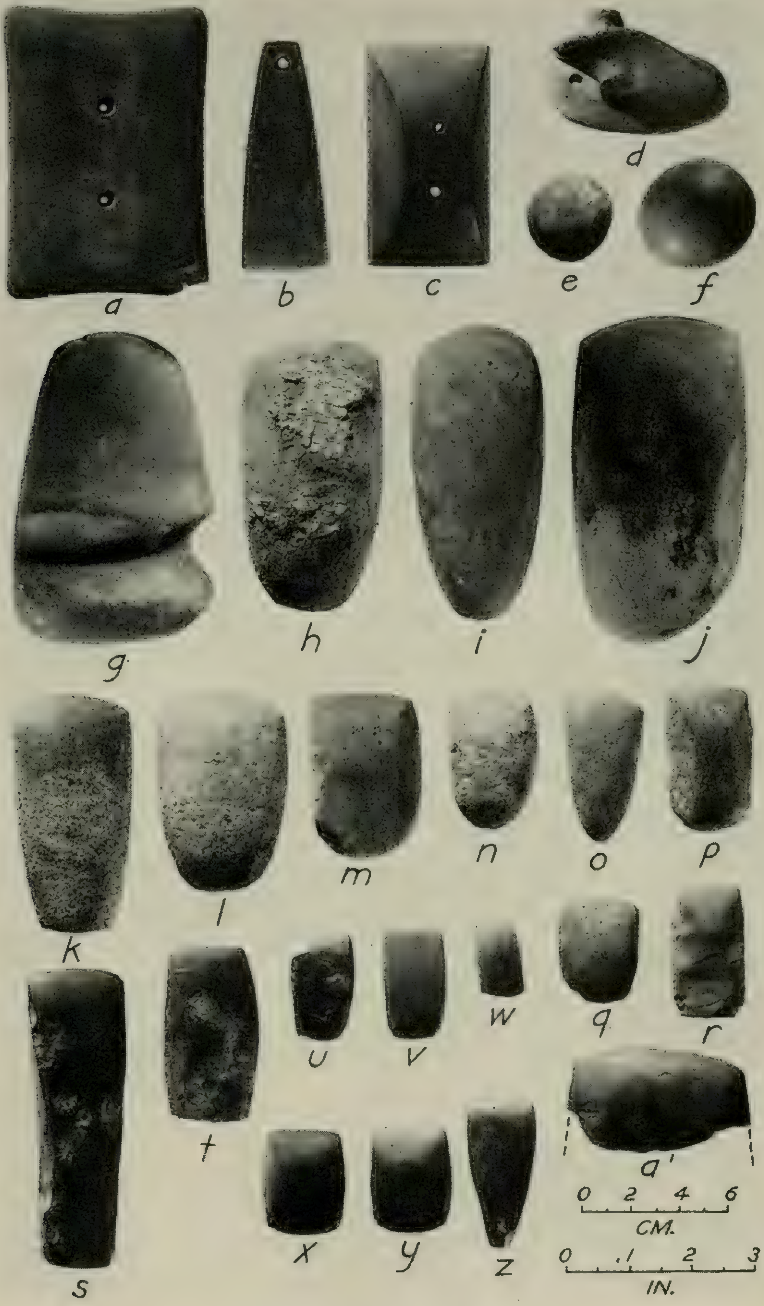
NATRIUM MOUND ARTIFACTS.

(For explanation, see p. 393.)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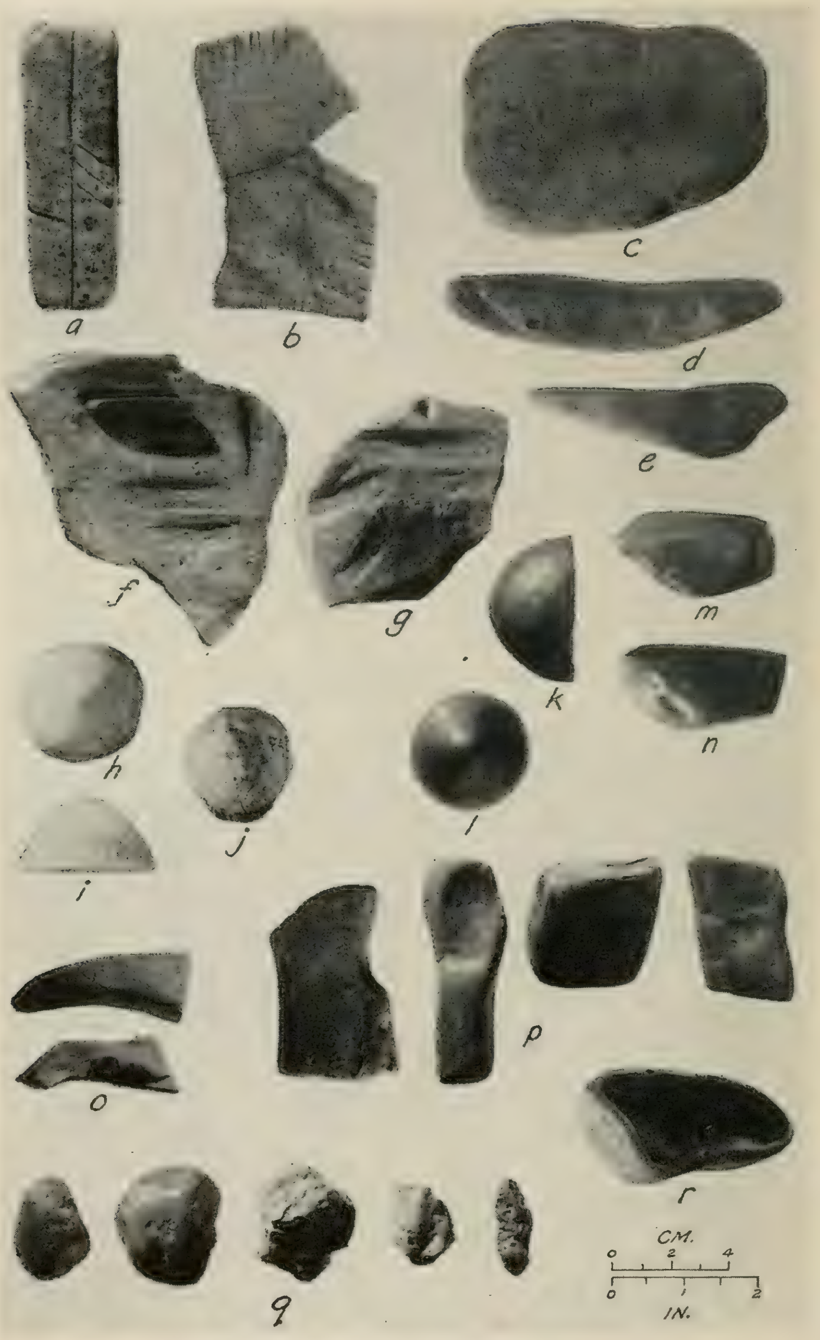
NATRIUM MOUND ARTIFACTS.

(For explanation, see pp. 393–394.)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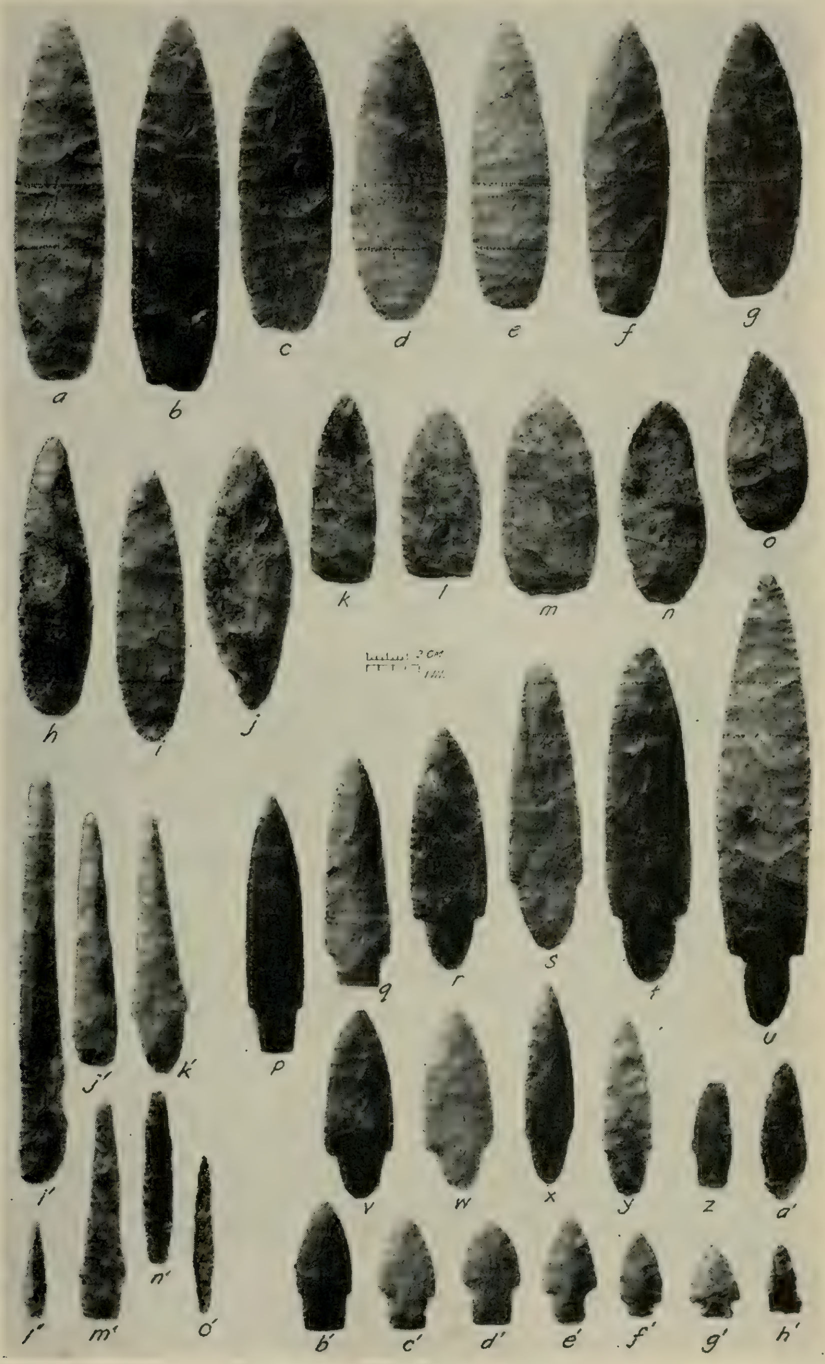
NATRIUM MOUND ARTIFACTS.

(For explanation, see p. 394.)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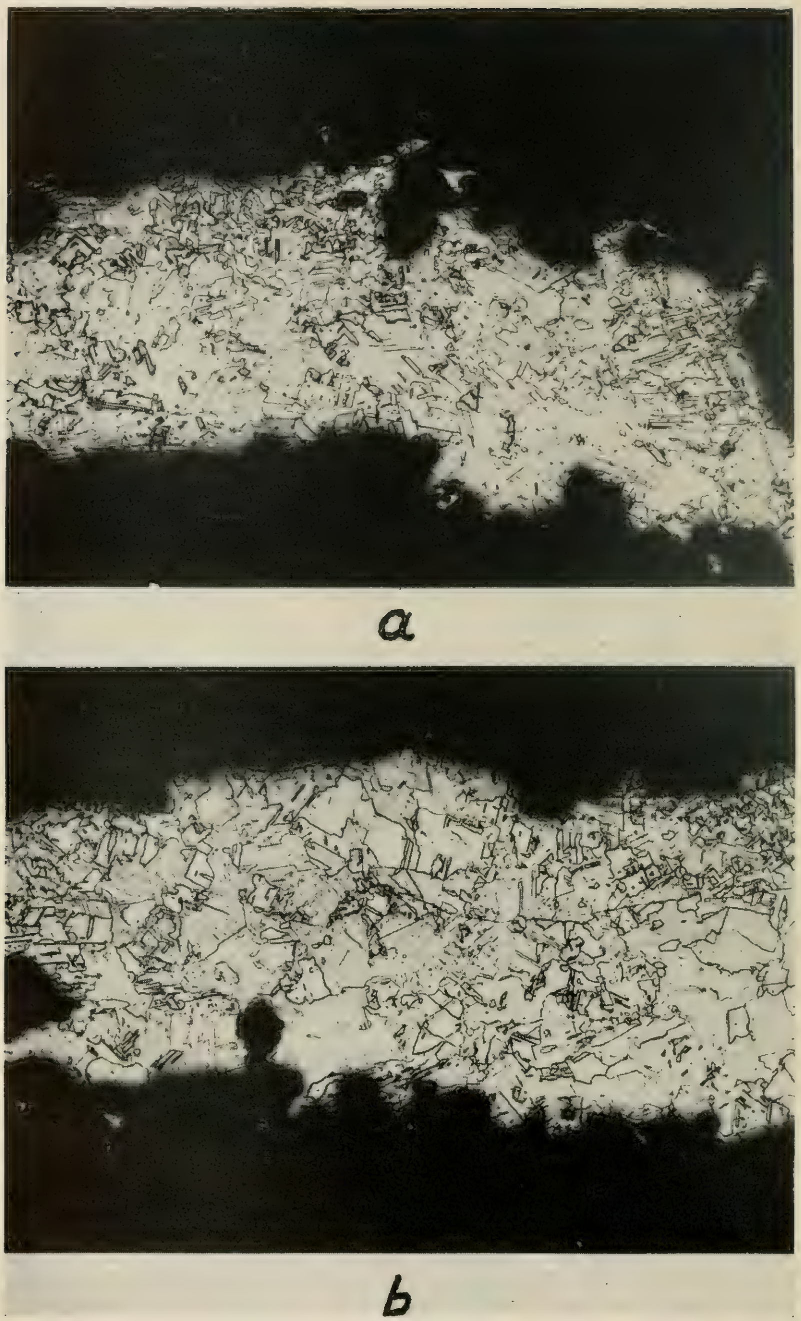
NATRIUM MOUND ARTIFACTS.
(For explanation, see pp 394–395.)



MICROSTRUCTURE OF CROSS SECTIONS OF BEAD.

Photographs by National Bureau of Standards.
(For explanation, see p. 395.)

SMITHSONIAN INSTITUTION
Bureau of American Ethnology
Bulletin 151

Anthropological Papers, No. 41

The Wind River Shoshone Sun Dance

By D. B. SHIMKIN

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PREFACE

The purposes of this study of the Wind River Shoshone Sun Dance are to broaden existing knowledge of the past and present forms of the ceremony among these people, to trace its history, and to outline the social and psychological factors affecting the development of the institution or, conversely, stemming from it. Despite inevitable omissions and possible errors, these goals have, I believe, been substantially achieved.

The most important previous work on the Wind River Shoshone Sun Dance is Lowie's "The Sun Dance of the Wind River Shoshone and Ute" (Lowie, 1919). Previous publications on Wind River Shoshone history are my "Shoshone-Comanche Origins and Migrations" (Shimkin, 1941) and "Dynamics of Recent Wind River Shoshone History" (Shimkin, 1942). The latter paper and two other reports, "Wind River Shoshone Literary Forms" (Shimkin, 1947a) and "Childhood and Development among the Wind River Shoshone" (Shimkin, 1947c) present additional information on personality-culture interrelationships among these people. My sketch of linguistic structure (Shimkin, 1949 a, b) will be of help in analyzing the texts presented.

I am indebted to the Board of Research of the University of California for financing the necessary field work in Wyoming in 1937 and 1938; to Forrest R. Stone, superintendent, and his staff at Wind River Indian Reservation for invaluable direct assistance and free access to all needed records; to my Shoshone informants and interpreters for aiding and guiding my field work; to Prof. H. E. Jones, of the Institute for Child Welfare of the University of California, for instruction and facilities needed for the psychological aspects of this study; to the Bureau of American Ethnology for permission to publish their manuscript materials; and to Mrs. Eleanor Garcia and Arthur Ferreira for clerical assistance. Professors R. H. Lowie, A. L. Kroeber, and Egon Brunswick, of the University of California; Dr. Philip Drucker, of the Bureau of American Ethnology; and my wife, Edith M. Shimkin, have made valuable criticisms of this report.

D. B. SHIMKIN.

Princeton, N. J., July 1947.

THE WIND RIVER SHOSHONE SUN DANCE

By D. B. Shimkin

THE OLD SUN DANCE

THE SUN DANCE COMPLEX

In the middle of the nineteenth century, the Sun Dance was the greatest, most spectacular, and most sacred tribal ceremony throughout a region stretching from the Blackfoot of Alberta to the Comanche of central Texas, from the Wind River Shoshone of Wyoming to the Santee-Dakota of Minnesota (Spier, 1921 b, pp. 459, 495). But, by the end of the nineteecth century, the Sun Dance had been suppressed or had died out in most of the Great Plains. (Dorsey, 1903, pp. 1–2; Lowie, 1915 a, p. 5; Marriott, 1945, pp. 304–305.) Yet, at the same time, it acquired new vigor on its western periphery. From the central point of the Wind River Shoshone, a Christianized modification of the ceremony has spread since 1890 to the Shoshone and Ute of Idaho, Utah, and Nevada, reaching the last area in 1933 (Hoebel, 1935, pp. 578–579). In 1941, the Sun Dance began to spread eastward. The Crow Indians, assisted by a Wind River and later a Lemhi Shoshone shaman, have revived the ritual with great vigor.

The Sun Dance appears also to have survived on its northwestern and northern margins, among the Kutenai, who have danced a profoundly modified but non-Christianized version at least as recently as the late 1930's, and among the Plains Cree (Turney-High, 1941, p. 178; Mandelbaum, 1940, p. 269).

The basic pattern of the Sun Dance is highly uniform. Although tribal differences are often noteworthy, particularly in regard to the social organization, motivations, and mythological connotations associated with the dance, many elements are recurrent throughout the area of distribution.

In generalized form, the dance, as performed around 1850, would consist of the following:[1]

It would be initiated during the winter months by some man or woman who had made a vow to do so or who had received a visionary command to initiate the dance. At a suitable moment in late spring or early summer, the scattered bands of the tribe would gather; often they would approach the rendezvous in a ceremonial manner, making four stops en route.

---

[1] Adapted from Spier, 1921 a and 1921 b.

Once the bands of the tribe had assembled in a camp circle, the first phase of the rites would begin. A tipi would be pitched in the center of the camp circle. Here the pledger and his sponsor, an old man with esoteric knowledge of the ritual, who guarded the Sun Dance fetich or who otherwise had great supernatural power, would together perform the secret preliminaries, purifying themselves, uncovering the fetich, and learning sacred songs or ritual paint designs. At this time also, a distinguished warrior or group of warriors went to hunt a buffalo bull, which had to be killed by a single shot, generally so that the animal's head fell east. The bull's hide was removed for later placement on the center pole. To find the center pole, scouts would be sent out to locate a suitable forked tree, which would then be "killed" and chopped down by a distinguished man, a virtuous woman, or a captive.

In the meantime, a larger number of men would erect a circle of 10 to 20 posts, possibly 20 yards in diameter, with an entrance to the east. The center pole would be brought in, and a bundle of brush, the buffalo skin, and possibly other objects such as a Sun Dance doll or offerings of cloth would be affixed. Then the pole would be raised in place with great formality. Once the center pole had been raised, rafters would be strung between the vertical posts, and brush piled up against the outer rafters to form a wall. In the lodge an altar comprising a painted buffalo skull, smudges of sweet-smelling grass, and a screen of branches would be built up on the west side, facing the center pole.

The second phase of the dance would begin with the formal procession of the barefooted, kilt-clad, white-painted dancers into the lodge. They would take their places on both sides of the altar. Gazing constantly at the center pole or the sun, they would raise and lower their heels, bending their knees, blowing their eagle-humerus whistles at every beat of the drum. They would keep on dancing, fasting, and thirsting for several days and nights, hoping in this way to get a vision or at least to arouse the pity of a supernatural being.

In both phases of the dance, many associated themes would interwork. The first phase, prior to the dance proper, was generally a time for initiation into societies and for lesser rites, as well as for general merriment. In the second phase, shamanistic performances including curing of the sick and exhibitions of supernatural power would often take place. War prestige and wealth would also gain outlets, with distinguished warriors recounting their deeds and giving away property at various moments during the ceremony. Finally, among many tribes, those who had vowed to do so would have themselves pierced through the pectoral muscles by skewers by means of which they would be tethered to the center pole. They would dance back and forth, attempting to tear themselves free, gaining supernatural aid through their ecstasy of pain.

Generally, the gaining of visions, usually by the pledger, would be the religious climax of the Sun Dance. The rite often ended abruptly after the passage of a prescribed period of dancing. Among some groups, minor ceremonies such as hanging children's clothing on the center pole ended the Sun Dance.

The history of the Sun Dance remains obscure. Spier's comparative study has been made partly obsolete by the acquisition of new data, although some of his most important conclusions still appear to be well founded (Spier, 1921 b). Clements' (1931) and Driver and Kroeber's (1932) statistical studies simply represent reworkings of Spier's data. Ray has made an important contribution to the problem by showing the impressive resemblances between the Sun Dance and the Spirit Dance of the Plateau (Ray, 1939, pp. 123-131). Ray's study, coupled with new information on the Sun Dances of the Kutenai and Kiowa, provides a line of departure for a new attack on this historical problem. [2] For it is now clear that important resemblances exist between those far-removed peripheral Sun Dances, resemblances which are found but sporadically in the intermediate areas.

The striking parallels between the Kutenai and Kiowa Sun Dances are the following:

(1) The Sun Dance leader is the keeper of a Sun Dance doll, which is the central source of supernatural power in the dance.

(2) The leader fasts prior to the beginning of the dance. Among the Kutenai, he contemplates the doll, possibly for several months prior to the dance, during which time he eats and sleeps as little as possible. Among the Kiowa, the sponsor of the dance hangs the sacred doll on his back, and rides out as a messenger to the various bands. During this ride, he is obliged to fast and thirst.

(3) The center pole is associated with a tabu against touching the ground. Among the Kutenai, the cut center-pole tree must not be permitted to hit the ground, lest the Sun Dance leader die. Among the Kiowa, a shaman treads four times along the length of the cut center-pole tree. Should he lose his balance and touch the ground, disaster would come to the tribe.

(4) Once the center pole has been erected, a man climbs up it. This appears to reflect the Bird-Man concept so strikingly developed in the Crow Sun Dance. As among the Crow, the Kiowa pole-mount-

---

[2] For the Kutenai, see Ray (1939) and Turney-High (1941); for the Kiowa, see Hunt (1934), particularly for references to center-pole ritual, and Scott (1911) and Spier (1921 a).

er has ritual functions, for he prays from the top of the pole. Among the Kutenai, his functions appear to be mundane, yet it should be noted that the Bluejay dancer in the Spirit Dance of Plateau tribes closely related to the Kutenai performs rites comparable to the Crow Bird-Man.

(5) Within the Sun Dance lodge, a screen of branches and a number of incense smudges form part of the ritual paraphernalia.

(6) The Sun Dancers fast and thirst, but torture is avoided.

(7) The climax of the Sun Dance is reached when supernatural power transmitted through a feather "kills" the dancers. Among the Kiowa, the Sun Dance leader, with a road-runner fan held in his hands, chases the dancers and "kills" them. Among the Kutenai, the shamans stroke the center pole with a feather to brush away the concentrated ailments of the tribe. This act causes the dancers to fall helpless to the ground, so that they must be revived by smudging.

(8) In both groups, the name for the Sun Dance probably refers to the structure in which the dance is held. This fact has been specifically established for the Kiowa, and is inferential for the Kutenai although unrecorded up to this time. (The Spirit Dance of the Flathead, which greatly resembles the Kutenai Sun Dance, is called by a name referring to the lodge.) (Ray, 1939, p. 130.)

These comparisons provide a tentative basis for reconstructing the early form of the Sun Dance. This early form may also have included a number of other elements, the antiquity of which is testified to by their wide distribution not only in the Plains but also in the Plateau Spirit Dance (as cited by Ray, 1939, pp. 128–131). Such elements are the division of the dance into a preparatory phase, usually secret, and a final, public phase, each 4 days in duration. Ceremonial sweating prior to the dance is another such association; still others are brush or uncut branches on the center pole (with "nest" symbolism), offerings to the center pole, and dancers being provided with whistles and painted with white and yellow. Ritualistic elements connected with the buffalo, such as the buffalo hide on the center pole and the buffalo skull on the altar, may also be ancient, but the evidence is by no means certain.

The reconstruction developed above may now be collated with other evidence. Both Spier and Kroeber have advanced powerful arguments for the view that the original center of the Sun Dance rests with the Plains Algonquians, especially the Arapaho and Cheyenne (Spier, 1921 b, p. 498; Driver and Kroeber, 1932, p. 235). Since no contrary evidence exists, these arguments may be accepted. Furthermore, Spier has given presumptive evidence that the Sun Dance had its origin among a nomadic people, for the village tribes built a special structure for the Sun Dance, whereas their other important ceremonies were almost always held in the permanent medicine lodges. While the history of the Arapaho is not known, the Cheyenne were village people until 1750, and became full-fledged nomads only toward the end of the eighteenth century (Strong, 1940, pp. 370–376). This fact reinforces Kroeber's view concerning the relative recency of the Sun Dance complex (Kroeber, 1939, pp. 77–78).

Nevertheless, by 1750 to 1765 the Kiowa appear to have borrowed the Sun Dance doll and probably other basic elements of the ceremony from the Crow (Scott, 1911, pp. 369–370; Mooney, 1898, p. 155). The deep infiltration and readjustment to Sun Dance elements on the Plateau likewise argues for a respectable antiquity in that area. Consequently, if the Sun Dance did originate as late as 1700, it must have been diffused with great rapidity.

Subsequent to this initial rapid diffusion, great elaboration of the original ritual appears to have developed in at least three centers—the Arapaho-Cheyenne, the Blackfoot, and the Dakota. The first center, possibly affected by eastern and southern influences, may have contributed the concept of a vow as the basis of the Sun Dance, a complex mythology and symbolism; sand painting, lodge-pole painting, and varied series of face and body paintings; fraternity control of the ceremony, with adoption and wife exchange; as well as other details such as the sunrise ceremony. In the second center might have grown up a great enrichment of ties with the buffalo—especially the tongue ritual; elaboration of outlets for war prestige and wealth through ostentatious property disposal; and lesser items such as plumes suspended from the dancers' little fingers. Spier has demonstrated the likelihood of a Dakota origin for the torture elements.

Beyond and above these three centers, every tribe invented refinements of its own, which exercised a greater or less influence on its neighbors. The Sun Dance was inherently unstable.[3] In the first place, the great migrations of Plains tribes, such as those of the Kiowa and the Comanche, exposed them to varied cultural influences.[4] Furthermore, individual travels greatly widened the range of contacts and the possibilities of far-reaching loans. Thus, Kiowa and Comanche visited the Mandan villages in 1802, Crow raided central Colorado in 1821, and early travelers met the Wyoming Shoshone on the Colorado River south of the San Juan in 1826. (Parsley *in* Coues, 1895, vol. 2, p. 757; Coues, 1898, pp. 51 ff.; Pattie, 1906, pp. 138–139.) Secondly, the Sun Dance is at present, and appears to have been in the past, a vehicle of intertribal participation. Dorsey has noted the long-continued participation of Arapahoes and Cheyennes in each other's Sun Dances (Dorsey, 1903, p. 23; also 1905, pp. 155 ff.). Thirdly, the vision component in the Sun Dance among many tribes provides an unusual opportunity for variability. Finally, this variability is increased by the fact that, among many tribes, the Sun Dance is performed at irregular instances, often years apart.[5] Thus such instability as Spier (1921 b, pp. 493–494) noted among the Dakota has unquestionably been widespread. This fact makes the tracing of the detailed relations between the Sun Dances of various tribes exceedingly difficult. It appears to be reasonably well established that the Sun Dances of the following tribes share significant resemblances: Arapaho, Northern Cheyenne, and Southern Cheyenne; Blackfoot and Sarsi; Ponca and Oglala; Assiniboine, Plains Cree, and Plains Ojibway; Canadian Dakota and Sisseton Dakota; Wind River Shoshone, Ute, and Hekandika Shoshone; Wind River Shoshone and Kiowa. The historical significance of these resemblances is by no means clear; in each instance, it is essential to weigh known historical facts and tribal traditions as well as resemblances and differences in the forms of the Sun Dance.

---

[3] Note Kroeber (1939, pp. 77–78) for the instability of the age-grade societies.

[4] For a discussion of Kiowa migrations, see Kroeber (1939, p. 80), where he cites the primary sources. For the Comanche, see Shimkin (1941).

In brief, the Sun Dance complex extended throughout the Plains in the middle of the nineteenth century. At present, it survives on the northern and western peripheries, and has diffused recently into the Basin, as well as reviving among the Crow. The typical form of the Sun Dance in the mid-nineteenth century, as known from the Arapaho, Dakota, and other centrally located tribes, appears to be considerably changed from its earlier form as reconstructed through comparison of two far-removed peripheral Sun Dances, the Kiowa and Kutenai.

The Sun Dance appears to have originated among the Algonquian Plains tribes, most probably the Arapaho and Cheyenne, possibly no earlier than the first half of the eighteenth century. It diffused very rapidly, its spread being aided by the movements of tribes away from the Northern Plains (Kiowa) and into them (Dakota, Plains Cree, etc.). Subsequent to initial crystallization and diffusion, secondary centers of elaboration and diffusion arose, especially among the Arapaho, Blackfoot, and Dakota. These secondary diffusions and the inherent instability of Plains culture, especially the Sun Dance, make detailed reconstruction of the spread of the institution extremely difficult. For instance, it has been believed that the Wind River Shoshone borrowed the Sun Dance from the Arapaho. In fact, it appears that the Shoshone derived their Sun Dance from the Kiowa via the Comanche, with subsequent strong influence from the Arapaho and lesser influences from the Blackfoot or Crow.

---

[5] For example, among the Crow, cf. Lowie (1915 a, p. 10); and among the Comanche, cf. Linton (1935, p, 420).

ORIGINS OF THE WIND RIVER SHOSHONE SUN DANCE

Within the framework of the history of the Sun Dance complex, as reconstructed in broad terms above, the origins of the Wind River Shoshone Sun Dance may be delineated to some degree, although the earliest direct reference to the ceremony among the Shoshone dates only to 1880.[6] Through examination of Wind River Shoshone traditions, of the known historical geography of the Plains and of comparisons between Shoshone and other Sun Dances, it is possible to arrive at a number of tentative conclusions.

Wind River Shoshone traditions concerning the origin of the Sun Dance are unusually explicit and uniform. They ascribe the first Sun Dance to a renowned chief and shaman named Yellow Hand (Ohamagwaya), the father, grandfather, and great-grandfather of two deceased and one living (1938) Sun Dance leaders. He is reputed by one informant to have been a Comanche, although another claimed that he was a Crow Indian. The first Wind River Shoshone Sun Dance supposedly took place either in the Green River country or in the Big Horn Mountains. Its inspiration was the vision of an old *white* man. Traditions regarding the Sun Dance were given by informants as follows:

JM[7] born ca. 1872:

> The main Sun Dance originated here, long ago. My great-grandfather Ohamagwaya said: "I am going to look for *bɔx* [Power]." He had a buffalo robe, and he painted this grey with white clay. Then, in the evening he went to a butte near Rawlins [Wyoming] and slept there overnight. There were no pictographs[8] there, but a man came from heaven and told him: "You are looking for great power. I'll tell you what to do. Get a center, forked cottonwood tree and twelve poles; build them like a tipi. Get willows and lean them against the poles. The center pole will represent God; the twelve posts, God's friends.
>
> "Get a two-year-old buffalo; face it west. Get an eagle; face it east. If anyone sick goes in, the buffalo will help him, with good power from the Sun. So will the eagle. Keep the buffalo's hide in shape with a bundle of willows. The cross-sticks will represent the Cross.
>
> "The first time we're going to dance, only five men will dance."

This agrees well with the account given to Lowie (1919, pp. 396–397), although Andy Bresil's (Bazil's) great-grandfather would have been JM's great-great-grandfather. He writes:

> According to Wawanabidi the Sun Dance is the oldest and foremost of Shoshone ceremonies. It was first performed by Andy's great-grandfather before there were any white men in the country. He found a picture of a white man, looked at it and kept it, putting it away. He began to dream of the picture which bade him have a Sun Dance and described the ceremony to him. His son kept the picture

---

[6] Hebard (1930, p. 295); Clark (1885, p. 363) also mentions this ceremony among the Shoshone.

[7] For the identifications of informants and data concerning them, see Appendix 2.

[8] The commonest way of gaining visionary power among the Wind River Shoshone was to sleep overnight by pictographs.

> but since his death it is not known what happened to it . . . Washakie, the old Shoshone chief, told Wawanabidi the foregoing facts. The founder omitted the dance the second summer, but the picture insisted on his celebrating it every year as a sacred ceremony. At times it changed from a darker to a lighter shade. At first the owner could not understand it but he concluded that it was supernatural and that if he obeyed it he should live well and happy while otherwise he should not live long. Whenever an Indian wanted to see it, several would sit round with Sun Dance whistles and blow them, then the owner would take it out from its wrappings. In the old days the dance was held when the high water went down. The founder himself conducted the ceremony every year, but after him they took turns.

Lowie also states:

> Barney ascribed the origin of the ceremony to a Shoshone who dreamt about it and was ordered to arrange it so as to attain happiness and longevity. [Lowie, 1919, p. 400.]

MT, born ca. 1852:

> Old Man Barney's mother once said that Ohamagwaya was the first man she knew to put up a Sun Dance, around the Green River country. But she had heard that the Sun Dance came from way back, even before his time. MT's father told him that the Sun Dance came with the Shoshone when they were created. It was their way of worship.

QQ, born ca. 1861:

> The first man to dance the Sun Dance was Ohamagwaya. A buffalo bull told him to have it. Then an old, white-haired man came to him and told him the same. From then on it has been continued. He painted the first Sun Dance doll. Because he did that they also kept that up.

PT, born ca. 1860:

> A gray-headed white man said that people should dance the Sun Dance. That's why they do it now.

PP, born ca. 1855:

> The ʒa:šošoni ("Good Shoshone") came from the Comanches long ago. About five or six families of them, Bazil [Pa:si] (Sacajawea's son), Witchie, Sarigant, Ohamagwaya . . . they had horses. The Shoshone first Sun Danced in the Big Horn mountains.

CW, born in 1873:

> Ohamagwaya adopted Washakie. He was a chief and a medicine man. He was the first man ever to start the Sun Dance.

Voget writes:[8a]

> [John Truhujo] also claimed that his variant [of the Sun Dance] had been originated by his great-great-grandfather, Yellow-Hand, a Crow Indian who had introduced the Sun Dance to the Shoshone.

Hebard's informant gave her rather curious, somewhat garbled, information, partially in agreement with other sources, and partially at variance. She quotes Andy Bazil (Bresil):

[8a] Dr. Fred Voget, personal communication.

> My grandmother [allegedly Sacajawea] introduced the Sun Dance among this tribe when she came back [from the Comanche], and my father Bazil [Pa:si] was made leader of that dance by my grandmother. I am today considered the leader of that dance because my grandmother originated the dance here. [Hebard, 1933, pp. 259–260.]

Elsewhere, Hebard states that Sacajawea was the aunt and foster-mother of Bazil (Pa:si), the son of her eldest sister; and that Bazil was born about 1802. (Hebard, 1930, pp. 64–67, 169–170.) Furthermore she claims that Bazil officiated at the first Sun Dance given by the Shoshone Indians of the Bridger Basin, where Washakie was chief. (Op. cit., p. 291.)

Hebard does not reconcile these reports with the statement which she obtained from DW:

> From old tradition that has been handed down about two centuries to the present time I have learned that the Sun Dance was first introduced to the tribe of Shoshone Indians about two hundred years ago, or about the year 1726. [Hebard, 1930, p. 292.]

Do these traditions have a historical basis? Genealogical information received from PS, and checked with other informants, indicates that Yellow Hand was in fact the common ancestor of Pa:si or Bazil, Andrew Bresil, John McAdams (JM), and John Truhujo (fig. 20). Yellow Hand's son Pa:si was first mentioned in historical records in 1856, and frequently thereafter.[9] In 1856 he was already a mature man, with several wives:

> Baziel [Pa:si], one of the Snakes who had lived in the fort with us during the last year, has raised about thirty bushels of wheat and some vegetables. He and his squaws have harvested it clean and neat. . . . [Hebard, 1930, p. 80.]

Yellow Hand appears to be mentioned in two early records. Ross, in relating his travels in Idaho and northwestern Wyoming in 1818–20, states:

> [McKenzie] fell in with the main body of the great Snake Nation, headed by the two principal chiefs, Pee-eye-em and Ama-qui-em. . . . The whole of this assemblage of camps was governed by the voice of two great chiefs, Pee-eye-em and Ama-qui-em, who were brothers, and both fine-looking, middle-aged men; the former was six feet two inches high, the latter above six feet, and both stout in proportion. . . . Trade was no sooner over, than Ama-qui-em mounted one of his horses and rode round and round the camp—which of itself was almost the work of a day—now and then making a halt to harangue the Indians respecting the peace, and their behavior towards the whites, and telling them to prepare for raising camp. Three days successively this duty was performed by the chief, and in the morning of the fourth all the Shirry-dikas decamped in a body, and returned in the direction whence they came. . . . The Shirry-dikas are the real Sho-sho-nes, and live in the plains, hunting the buffalo. They are generally slender, but tall, well-made, rich in horses, good warriors, well-dressed, clean in their camps, and in their personal appearance bold and independent. [Ross, 1855, vol. 1, pp. 248, 249, 253, 259.]

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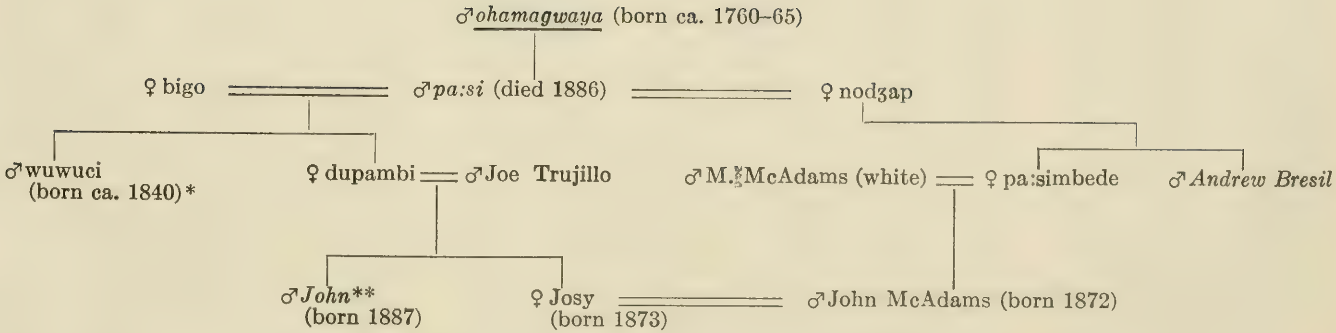
[9] See references cited in Hebard (1930 and 1933).


♂ *ohamagwaya* (born ca. 1760–65)
♀ bigo
♂ *pa:si* (died 1886)
♀ nodʒap
♂ wuwuci (born ca. 1840)*
♀ dupambi
♂ Joe Trujillo
♂ M. McAdams (white)
♀ pa:simbede
♂ *Andrew Bresil*
♂ *John*** (born 1887)
♀ Josy (born 1873)
♂ John McAdams (born 1872)

*Married to and older than PS, born 1845.
**Also known as Trehero and Truhujo.

Figure 20.—The lineage of Ohamagwaya or Yellow Hand. (Sun Dance leaders are in italics.)

The linguistic identification of Ross' "Ama-qui-em" and Ohamagwaya or Yellow Hand seems extremely probable, especially since the time and area coincide.

The other record is Anza's report of a conference with Comanche leaders to sign a treaty against the Apache on February 28, 1786, at Santa Fe (Thomas, 1929). Anza lists the names of all the important personages, including "Oxamaguea," the son of the chief of the Kučandĭka, and an interpreter or go-between. The Kučandĭka band of Comanche at that time frequented the country between the Arkansas and Red Rivers, and numbered 157 tents. North of them were the Yamparĭka, who lived between present northern Colorado and the Arkansas River, and the Yupë, who extended as far as the southern part of present Wyoming. Representatives of the two latter bands were also present at the meeting with Anza.

Does Anza's report actually refer to the Ohamagwaya of Shoshone tradition? The linguistic identification is unquestionable. The circumstance of age shows no discrepancy: if Yellow Hand was born, say in 1760–65, he would have been a young man in 1786 and in late middle age by 1820, the date of Ross' account. Yellow Hand's son Pa:si, born presumably about 1810, would have been a child of maturity but not of improbable senescence. Russel's account of 1842 lists chiefs other than Yellow Hand, so he had probably died prior to that date, having lived to his late 60's or early 70's (Russel, 1921, pp. 114–115.) New Mexico and Idaho are far removed, it is true, yet such travels have been made repeatedly by Shoshone and other Plains Indians. And certainly a chief's son from among the Comanche, fresh from Spanish contacts, would be in a position to rise to high rank among his more remote Shoshone kinsmen.

In short, it appears that Wind River Shoshone traditions have a substantial historical foundation. Yellow Hand did apparently come from the Comanches, presumably about 1800, and did rise to be a great Shoshone chief by 1820. But did he actually introduce the Sun Dance?

The historical geography of the Plains provides some evidence on the probability of this event. The pertinent facts are the following: The Shoshone and Comanche, a single people up to about 1800, were fully established on the Plains by the early eighteenth century. The Shoshone were fighting with the Blackfeet in Saskatchewan as early as 1730 (Shimkin, 1941). Thus opportunities for an early transmittal of the Sun Dance from the Algonquians to the Shoshone existed; no proof is available, however, that such a transmittal ever took place. Deriving the Shoshone Sun Dance from the Comanche presents difficulties, since the Sun Dance was never deeply embedded in Comanche culture. Moreover, as will be shown below, the Comanche

Sun Dance lacked important traits such as the Sun Dance doll, which typified the early Shoshone rite. On the other hand, both Shoshone and Comanche Sun Dances clearly resemble the Kiowa ceremony, which is the most likely origin, especially since the Kiowa were the firm allies and constant companions of the Comanche from 1790 on (Mooney, 1898, pp. 161–165). Consequently, it would have been possible for Yellow Hand to have acquainted himself with the Kiowa ritual and transmitted it to the Shoshone, especially if the latter already had some prior acquaintance with the Sun Dance. This derivation of the Shoshone Sun Dance is strengthened by the curious association of both the Shoshone and Comanche rites with a white man, a feature almost certainly of Christian and probably Spanish origin. (For the Comanche, see Linton, 1935.)

These conclusions collide sharply with those of Spier, which are based only on comparisons of Sun Dance forms, and of Clements (1931), and Driver and Kroeber (1932), which are based upon statistical reworking of Spier's data. Spier is torn between the Gros Ventre and the Arapaho as the originators of the Shoshone Sun Dance, finally deciding in favor of the Gros Ventre. Clements derives the Wind River ceremony from the Arapaho, but also notes a relatively high Shoshone-Kiowa correlation. Driver and Kroeber come out flatly for an Arapaho origin.

But it must be recognized that Spier did not have available any data on the Kutenai or Comanche, or full data on the Wind River Shoshone, Kiowa, or Plains Cree. Furthermore, his element list did not sum up his data completely; his interpretation was qualitative in character and stressed resemblances, with insufficient attention to differences.

A more balanced trait list with fuller information included is presented below.[10] The statistical results differ fundamentally from those of Clements, and Driver and Kroeber; this illustrates the extreme unreliability of the statistical analysis of small element lists (i.e., where the number of elements listed is less than 500),[11] and the imperative necessity of examining the composition of each correlation (i.e., whether based upon a large number of mutual presences or of mutual absences, etc.) and hence the inferences that may be derived therefrom. At best, the statistical presentation and quantitative analysis of small element lists simply represent the numerical expressions of the historical and ethnographic judgment of the author.

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[10] This list is based upon Shimkin's field work, St. Clair (Appendix 1), Lowie (1915 a, 1919, 1935), Hunt (1934), Scott (1911), Spier (1921 a and b), Linton (1935), Dorsey (1903), Kroeber (1902–1904), Walker (1917), Wissler (1918), Mandelbaum (1940), Turney-High (1941), and Ray (1939).

[11] See Chretien (1945) for an outstanding critique of quantitative methods in ethnography.

This is frankly and solely the purpose of the statistical analysis in the present instance.

TABLE 1.—*Comparison of the Wind River Shoshone and other Sun Dances* [1]

Elements	Wind River Shoshone (Old form)	Kiowa	Comanche	Arapaho	Oglala Dakota	Crow	Blackfoot	Plains Cree	Kutenai
1. Name: Sacrifice lodge	—	×	0	×	—	×	0	—	(×)
2. Sun-gazing dance	—	—	0	—	×	—	0	—	—
3. Thirsting dance	×	—	0	—	—	—	0	×	—
4. Vision needed to give dance	×	×	×	(×)	(—)	—	—	×	×
5. Vow is basis for dance	—	—	(—)	×	×	×	×	×	—
6. Medicine bundle essential	×	×	(—)	×	—	×	×	—	×
7. Includes Sun Dance doll	×	×	(—)	—	—	×	—	—	×
8. Bundle transfer to sponsor	—	—	(—)	×	—	×	×	—	—
9. Sun Dance sponsor fasts prior to dance	0	×	0	(—)	(—)	×	×	0	×
10. Band makes 4 ritual stops en route to Sun Dance.	—	×	×	0	(×)	×	×	0	—
11. Preliminary tipi	×	×	0	×	×	×	×	×	—
12. Women assist in ritual	—	—	0	×	(—)	×	×	—	—
13. Altar	—	×	0	×	×	—	×	×	—
14. Drumming on hide	—	×	0	×	(—)	(—)	×	×	—
15. Buffalo tongues accumulated	×	—	(—)	—	×	×	×	(—)	(×)
16. Tongue feast	×	—	(—)	—	×	×	×	(—)	×
17. Avowal of virtue	—	—	(—)	—	×	—	×	—	—
18. Ritual buffalo hunt	×	×	×	×	—	×	×	—	—
19. Whole skin taken	—	—	0	×	—	×	×	—	—
20. Back strip only taken	×	×	0	—	—	—	—	—	—
21. Thongs cut	—	—	0	—	—	—	×	—	—
Center-pole cutting:									
22. Returning scouts met	×	—	0	×	×	—	—	×	—
23. Sham battle	×	×	0	×	×	—	—	—	—
24. Virtuous woman tree feller	—	—	×	(×)	×	×	—	—	0
25. Captive tree feller	—	×	×	(—)	—	×	—	—	—
26. Coup counted on tree	×	—	0	×	—	×	×	×	—
27. Stripping twigs	×	—	0	×	×	—	×	—	—
28. Riding double	×	×	0	—	—	—	—	×	—
Center pole decorated with:									
29. Brush bundle	×	×	×	×	×	×	×	×	—
30. Buffalo skin	×	×	×	×	×	×	—	—	—
31. Sun Dance doll	×	—	—	—	(×)	—	—	—	—
32. Cloth	×	×	0	×	×	—	×	×	×
33. Digging stick	×	×	0	×	—	—	×	—	—
34. Paint	×	0	0	×	×	×	×	—	×
35. Feints in raising center pole	×	—	×	×	×	×	—	—	×
36. Center pole raised by magic	—	—	(—)	×	—	—	×	×	—
37. Center pole mounted	×	×	0	—	—	×	×	×	×
38. Center pole tabu on touching ground	(—)	×	0	—	0	—	—	—	×
39. Dance lodge: roofed enclosure	×	×	×	×	—	—	×	×	—
40. Tipi	—	—	—	—	—	×	—	—	×
41. Altar: Buffalo skull	—	×	(—)	×	×	×	—	×	—
42. Smudge piles	(—)	×	0	(—)	(—)	×	×	×	×
43. Excavation	—	—	(—)	×	×	(×)	×	×	(×)
44. Screen	×	×	×	×	×	—	×	×	×
45. Preliminary dance	—	×	×	×	×	×	—	—	—
46. Sun Dancers' fraternity	—	—	—	×	×	—	×	—	—
47. Dancers: Sage adornment	×	×	0	×	—	—	×	—	(—)
48. Finger plumes	×	—	(—)	—	—	×	×	—	(—)
49. White paint	×	×	0	×	—	×	—	—	—
50. Successive paints	×	×	—	×	—	—	—	—	×
51. Incoming procession and blessing	×	—	0	×	×	—	×	—	—
52. Dancers' footsteps brushed away	×	(—)	(—)	(—)	(—)	0	0	0	×
53. Sunrise dance	×	—	(—)	×	×	—	—	—	—
Shamanistic performances:									
54. Water from center pole	×	—	(—)	×	(—)	—	(—)	×	—
55. Weather control	×	(—)	(—)	(—)	(—)	—	×	(×)	—
56. Clairvoyance	—	(—)	(—)	(—)	(—)	×	(—)	—	×
57. Supernatural power via feather "kills" dancers	(×)	×	(×)	—	—	—	(—)	—	×
58. Torture	—	—	—	×	×	×	×	×	—
59. Flesh sacrifices	—	—	—	—	×	×	×	×	—
60. Warrior's fire	×	—	(—)	×	—	×	×	×	—
61. Ears pierced	—	—	(—)	×	×	—	—	—	—
62. Sexual license	—	—	(×)	×	×	—	—	—	—

See footnote at end of table.

TABLE 1.—*Comparison of the Wind River Shoshone and other Sun Dances* [1]—Continued

Elements	Wind River Shoshone (Old form)	Kiowa	Comanche	Arapaho	Oglala Dakota	Crow	Blackfoot	Plains Cree	Kutenai
63. Children's clothing offered	×	×	×	×	(–)	–	(–)	–	–
64. Spectators blessed	×	–	(–)	(–)	(–)	(–)	×	×	–
65. Dancers drink prepared drink	×	×	0	×	–	–	–	–	–
Correlation with Wind River Shoshone ([2])	–	+.42	+.24	+.04	–.32	–.40	–.14	+.09	+.24
Total similarities:									
Mutual presences (××)	–	21	9	25	15	15	20	15	13
Mutual absences (––)	–	17	12	9	11	10	9	16	19
Total	–	38	21	34	26	25	29	31	32
Total differences:									
Absence-presence (×–)	–	16	13	13	23	22	16	22	25
Presence-absence (–×)	–	9	5	16	14	16	15	9	6
Total	–	25	18	29	37	38	31	31	31

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[1] Symbols: ×, present; –, absent; (×), presumed present, occasionally present; (–), presumed absent; 0, no information, or information is contradictory.

[2] $Q2=\frac{ad-bc}{ad\times bc}$ where *a*, *b*, *c*, *d*, are respectively the sums of mutual presences, presences and absences, absences and presences, and mutual absences for the two groups correlated.

In other words, I believe that the Wind River Shoshone Sun Dance is highly differentiated, but shows closest resemblance to the Kiowa, whence it was largely derived. The common derivation from the Kiowa explains resemblances to the Comanche, resemblances which would probably be greater with fuller information. In regard to the Kutenai, the bulk of the similarities are mutual absences, which originate largely from the conservative, peripheral character of both ceremonies. Nevertheless, some Kutenai-Shoshone contacts are possible (especially via the Flathead) and may account for the sharing of such specialized traits as sweeping away the dancers' tracks. Much of the resemblance between the dances of the Plains Cree and their neighbors can also be explained on the basis of the marginal character of their Sun Dances. But here evidence of contact, and particularly very recent contact, is stronger, as Spier has pointed out. In my opinion, however, common features such as the name "Thirsting Dance" and the prayer for the spectators represent Shoshone influences on the north rather than the reverse. On the other hand, northern influences from the Blackfoot or Crow do appear to be represented by such elements as counting coup on the center-post tree, the buffalo-tongue feast, the warrior's fire, and finger plumes. Finally, while the Arapaho and Shoshone exhibit many profound differences especially ascribable to the richer development of the Arapaho ceremony, Arapaho influence on the Wind River Shoshone Sun Dance has been strong: stripping twigs from the center-pole tree; the procession and blessing at the beginning of the Sun Dance proper; the sunrise ceremony; and the concept of drawing water from the center pole—these probably represent loans from Arapaho to Shoshone.

The traditional, historical, and comparative data discussed above can now be summarized into a reconstructed history of the Wind River Shoshone Sun Dance:

(1) During the eighteenth century, Shoshone contacts with Algonquian Plains tribes probably gave the former an acquaintance with the Sun Dance, and prepared the ground for diffusion.

(2) Around 1790, a prominent young Comanche, Yellow Hand, became thoroughly acquainted with the Kiowa Sun Dance and gained some knowledge of Christian concepts from the Spaniards.

(3) Some time later, possibly by 1800, Yellow Hand moved north to the Eastern Shoshone (who became the Wind River Shoshone under Washakie in the nineteenth century). Yellow Hand introduced the new ceremony—or possibly a new and dominant variant of an already known ceremony—to the Eastern Shoshone.

(4) During his lifetime, Yellow Hand was the usual leader of the Sun Dance. After his death, leadership of the Sun Dance concentrated largely in his lineage, with his son Pa:si and his grandson, Andrew Bresil, being the customary Sun Dance leaders.

(5) During the nineteenth century, up to the end of Shoshone nomadism in 1880–85, other influences in addition to the original Kiowa via Comanche impulse modified the Wind River Sun Dance. The most important of these came from the Arapaho and Crow or Blackfoot. The Shoshone, in their turn were the major sources of the Bannock and Ute Sun Dances, and may have influenced the Plains Cree of the far northern Plains.

(6) During the nineteenth century, the Shoshone developed a number of features in the Sun Dance peculiar to themselves, such as the preliminary hole-digging ceremony. They also adapted elements from other tribes. Thus the Shoshone Magpie ceremony is simply a secular, mischievous children's diversion among the Crow. Among the Shoshone, furthermore, the order of many details has been transposed. For example, the feast on tongues is generally after the dance, rather than before or during the dance, as among the Blackfoot and Crow.

THE EARLY SHOSHONE SUN DANCE: RECONSTRUCTION

As the result of the series of loans and developments described above, the Shoshone evolved a reasonably stable ceremony, probably by 1820 or 1830. This continued without major changes until about 1880. The main features of the ceremony were the following:

The Sun Dance or, literally, "Standing in Thirst" (*taguwënër*) was directed by a shaman (or one of a small group of shamans) who had gained this right partly through paternal inheritance, partly through repeated participation, and partly through recognition of his supernatural powers. Each winter or somewhat less frequently, this shaman would announce that he had seen a vision, usually of an old man, in which he had been commanded to give a Sun Dance on pain of illness or death, the usual sanctions for the disobedience of supernatural orders. The shaman was to supplicate for success in war, relief from illness, long life, and good luck.

As summer approached, messengers who were required neither to have special qualification nor to fast or perform ritual acts were sent out to all the bands of the Wind River Shoshone and to friendly related groups such as the Dɔyahin or Mountain Shoshone.[12] Sometime in June these bands would gather (without any set number of stops en route, or any other rites), probably at Wind River, on the way to the summer rendezvous with the trappers at Bridger Basin or Pierre's Hole. (Shimkin, 1938, 1942.)

At an undetermined time before the Sun Dance, the leader commissioned a special carver known for his ability (such a one was Paixwaci) to prepare the Sun Dance doll. The carver prayed to Our Father (*damë'ap:ë*) and then prepared the image, a wooden head painted red, with a feather stuck in back. MT did not know more about this head or its significance, which is suggested by TC to be the "Spirit of the Sun Dance" (MT, TC, JM, GR). PT adds that it was a woman's head and picture, about 8 inches high. A single informant described a doll of Crow style. PS said the doll was of buckskin, painted yellow or white, and had no feathers on it. And QQ remarked that the doll was left on the Sun Dance center pole when the lodge was abandoned, so that a new doll had to be prepared each year.

Once the tribe was together and camped in a rough, unordered circle, the prospective Sun Dance leader pitched his tipi in its center. A few days later, he went east of the leader's tipi a hundred yards and more with a number of old warriors who had repeatedly counted coup. One of the old men had a digging stick. They alined themselves exactly east of the leader's tipi by the sun, for it was then early in the morning.

At this time the old man with the digging stick prayed: [13]

us η̣:di'βiʒ̆ tĭmp dɔ'tĭwĭkhɛndë' ʒa:ηk
That is / the-great / rock / (that which) dug out-will be / well /

pëηkhaint gë'arɔ marĭgëarɔ
(this) place-from / go out-will // (That) those visible here will go out

ʒa:ηk pë'ηkhaind nánišundheηgën us šuβega
well / (this) place-from / (I am) praying // That is / ended

---

[12] According to PT, a Dɔya.

[13] According to QQ, GR interpreting.

More freely, "That is the great rock to be well dug out, to go out from (its) place. That the people here will go out well from this place, for that (I) am praying. That is ended."

After this, the old man arranged the excavated rocks in a neat pile into which he stuck the digging stick. (The pit symbolized the trench dug by warriors during battle, according to TC.) The digging stick was left in the pit.

Probably the same night, the Sun Dance leader and a few companions begin practicing Sun Dance songs, some of which had been dreamed—not necessarily by the Sun Dance leader—during the past winter. Dancing also would be practiced, but there is no evidence that complex preparatory rituals like those of the Arapaho, Cheyenne, or Crow took place (Lowie, 1915 a; Dorsey, 1903 and 1905). The preparatory singing and dancing lasted for either 3 or 4 nights, the duration possibly depending on the leader's vision.[14]

A day or two later, but not more than 2 days before the start of the dance proper, the ceremonial buffalo hunt took place. This was entirely apart from the one necessary for the collection of buffalo tongues for the feast, which seems to have been purely informal. Rather, its purpose was to secure the head and attached strip of skin from the back which adorned the center pole.

A number of hunters went out, but only one was allowed to kill the desired animal.[15] This privilege was, in fact, a great honor for a noted warrior, and memory of that distinction was long cherished. Thus in 1938, Quitan Quay remembered that Guy Robertson's grandfather, Waʒinamp, had twice killed the bull for the tribe.

Nevertheless, the hunt was simple. No ill omen was implied if the hunter needed more than one shot to dispatch the beast. There was no prayer before skinning. The meat was left untouched. There was no ceremony on the men's return comparable to that among the Kiowa or Arapaho (Hunt, 1934; Dorsey, 1903). In fact, the only ritual consisted of a prayer spoken by the principal hunter when the party sighted the buffalo.

He prayed:[16]

nïr i′kïǯa ṃbe′kahandë′ ëna′nišundheŋgɛn
I / right now / for that which killed-will be / to you-(I am)-praying/

ṃbe′kahandɔ′ʿ ta′guwënërux ën wïʿ
for that which killed-will be / Sun Dancing // You / now′

marïšu′ndhaindë pa:′ndai us su:βega
these visible here-bless-will / down from above // That is / ended

---

[14] Lowie (1919, p. 393) reports 3 nights; St. Clair (Appendix 1) reports 4 nights.

[15] Lowie (1919, p. 397) reports that four hunters went out.

[16] According to QQ, GR interpreting.

In other words, "I, at this moment indeed, am praying to you for that which will be killed, for that which will be killed Sun Dancing. You will bless from above those who are here. That is ended."

The next important event was the cutting of a center pole. The full circumstances of this act are somewhat obscure. Lowie has given a detailed account:

> One company of men went to locate the trees to be cut down, leaning poles against them for identification. Some stayed by these trees and sat around playing the hand-game and pretending to be enemies of the Shoshone. The remainder went back to the distance of about half a mile. Two men were detailed to scout for the enemy. They went off and came back hallooing and singing. The people said, "Those scouts have seen something." They gathered piles of buffalo chips, making a big heap. All formed a circle round the chips, getting close together and leaving only a narrow gap for the entrance. The scouts entered the ring and moved all the way round, then the circle was closed. The chief shouted at them to announce quickly what they had discovered. "The enemy is at such and such a place," they would say. Then the people got horses and rushed over there. When they got near, the enemy tried to get away through the timber. Then there was shooting and hallooing as in a real fight. The Shoshone rushed in and struck each of the marked trees. Three brave warriors were to cut the center pole. After all the trees had been struck, another party came from behind to chop the trees down. When a tree fell, the Shoshone rushed in and broke off the limbs. Since there were no wagons in those days, the felled trees were dragged by a group of horsemen on either side of the logs, ropes being tied to these at one end, and the other end to the saddle or held in the hand. While the poles were dragged along there was no more of the sham battle, though nowadays it is held there. [Lowie, 1919, pp. 397–398.]

According to St. Clair,

> . . . [the Sun Dance leader] leads the people into the mountains and they have a sham battle, the trees representing the enemy, at which they shoot. Then the men pick out the straightest of the trees that were hit and the women chop them down, and the men load them up. The [party with the center pole] goes ahead and the other party drops back, and they have a sham-battle over the poles till they reach the camp. Then the sham-battle is turned into a parade around the camp. [St. Clair, Appendix 1.]

According to my informants, a chief first prayed to the center pole, then killed it, counting coup. Young men broke off the branches. Young women went along, riding double with the youths.[17]

TC says:

> In the early days, boys of 6 to 15, as well as little girls (?), were taken along when the center pole was being procured. The children would wait for the tree to fall, then each would run up and try to break off a limb. They would keep the limbs they got—a large limb meant good fortune, a small one not much luck in the future. The tree was not further trimmed, though nowadays it is trimmed with an ax.

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[17] There was now the sexual freedom occurring generally during Shoshone social events, but no such formal license as among the Arapaho and other tribes (Spier, 1921 b, p. 473).

The other posts were just hauled or dragged by men on horseback. Smaller wood was gathered by the women and carried on their backs, or rarely on horseback.

When the party reached the Sun Dance field, they staged a sham battle in which two warriors hit the center pole. Soon after the center pole had been dragged to the field, the Sun Dance leader lashed a bundle of willows to the top fork of the tree. Around the tree itself brave warriors painted broad bands of black—one for each coup counted, but not more than four in all (QQ; also Lowie, 1919, p. 398). Rags adorned the ends of the forking branches.

Now the center pole was lifted into place by means of pairs of joined tipi poles. The lifters made three feints, each preceded by successively louder singing, accompanied by the rhythm of the tipi poles hitting together. The fourth try was successful. [18]

After this, the workers put up the side posts. [19] The rafters were now put in place, the "back-bone" (JM) running due west to east being laid down first, followed by the rafter running from north to south, then the one running from south to north; the others following in irregular fashion. Then the side posts were connected by cross rafters, against which the people leaned brush, leaving a wide opening on the east side.

Inside the lodge, several additions remained. A man climbed up the center pole to place in position the buffalo bull's head with attached backstrip and tail which was handed to him. This head had been painted with yellow clay and decorated with eagle tail feathers; sage had been stuffed in the nose.[20] The head and backstrip were placed in the fork so that the head faced west, the backstrip covered the willow bundle, and the tail hung down the east side of the fork. The Sun Dance doll was attached to the center pole possibly at this time;[21] ritualistic details are lacking. At this time also, an eagle was hung with its head to the east, from the very tip of the "backbone" nearest the center pole. (TC, JM).

JM's account of a Sun Dance altar, however, seems erroneous, and probably confused with the Arapaho structure.

Formerly, a willow about 4 feet high, with many branches, decorated with eagle down, was placed in the Sun Dance lodge.[22] It stood underneath the "backbone"

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[18] The fifth try, according to St. Clair (Appendix 1).

[19] According to my informants, the number of posts was invariably 12, and the lodge illustrated in Lowie (1919, p. 396) which dates to 1911 or 1912 also has 12 posts. This pattern, however, does not appear to be old, since Clark (1885, p. 363) mentions 10 outer posts.

[20] St. Clair (Appendix 1). MT and PS insisted that the buffalo head was painted yellow rather than white, as stated by St. Clair.

[21] Among the Ute, however, the Sun Dance doll is affixed on the afternoon of the second day (Opler, 1941, p. 563).

[22] The existence of an altar screen is also suggested by its presence among the Ute (Opler, 1941, p. 563), but I could get no other confirmation for JM's statement.

> 10 feet west of the center pole. Just south of this, on a tripod, was a pipe covered with buffalo robe, with feathers lying on top.
>
> This pipe had the following history. It had been sent by the Great Father, inherited by Ohamagwaya, later buried with him. It was called *doiwičimo* [a compound I could not analyze; "pipe" is *do*]. It was a long straight pipe, painted with different animals—eagle, otter, etc. Normally, it stayed on a tripod in back of his tent, in a special fringed case. If an enemy were to go under this tripod and pray to the pipe, we couldn't kill him.
>
> Only Ohamagwaya might take this pipe out of its case, which he did without ceremony, but only for the Sun Dance. His wife, who had passed the menopause, would carry the pipe in traveling.[23]
>
> This pipe was prayed to for a long life, never smoked. It was also revered by the Fort Hall people. The Arapaho still have one like ours was.

MT gave a vague confirmation of this account: he had heard that at one time there was an old man who had a tribal pipe for the Shoshone. He gave it away (?).

As this day neared its end, the prospective dancers prepared themselves. Their number was few—5 the time of the very first dance (JM), maybe up to 12 (MT) or, rarely, 20 (QQ)—for people were afraid of the hardships involved. Although they never tortured themselves by putting skewers through their flesh and dragging skulls from the thongs attached to the skewers, they still had to fast, thirst, and dance for 4 days (DW, MT). One informant (DW) claimed that in those days the young men would participate in a Sun Dance only once in their lives, though nowadays some do it nearly every summer, but actually it appears that repeated participation is an old trait. Women did not dance.

Those who wished to dance, bathed or sweated now (TC). They gathered after that in the Sun Dance leader's tipi, where they painted each other with white clay from the waist up.[24] This was done without ritual, although some might first purify themselves with cedar (wa:pi, *Juniperus californica*) (DW, TC). Then they hung unadorned, single-holed whistles of eagle humerus (no other bone may be used) from their necks, and tied an eagle down feather (*pį'ɔyip*) to each little finger; some held a prayer-horn.[25] They were naked except for breechclouts and aprons of antelope skin. Their hair was not specially dressed (TC), but around the head and waist they often put "water sage" (pa: 'wɔhɔ', *Gnaphalium*), which contributed its aromatic smell but no supernatural power (DW).

Sometimes the people would lay those seriously ill on the dancing ground inside the lodge so that they might get well in that holy place (QQ).

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[23] Blood, especially menstrual blood, is extremely polluting and very dangerous in contact with any bearer of supernatural power, according to Shoshone theory.

[24] They also painted white their hair and the buffalo robes which they wore, according to St Clair.

[25] Hebard (1930, figure opp. p. 286) shows such a horn; this trait still persists among the Ute (Opler, 1941, p. 564).

When dusk had come, the singers took their places around a large drum on the southeast corner of the lodge. One of them had a buffalo scrotum rattle. Women helped in the singing, although not in the drumming. Rather, they waved fronds of sagebrush rythmically up and down.

Soon the dancers were ready. In single file, blowing their whistles, they shuffled from the leader's tipi to the west end of the outside of the lodge. Then they circled it clockwise either two (QQ) or four (JM) times before entering. Once inside, each took whatever place in the western half of the lodge he might desire, except for the position directly under the "backbone," which was always occupied by the leader. At this moment the Sun Dance leader stepped up to the center pole for prayer. This was directed toward Our Father, and besought long life, safety in battle, the avoidance of illness.[26] The prayer over, the singers began their song, while the dancers jogged up and down in place to the beat of the drum and the blasts of their whistles, gazing constantly at the Sun Dance doll or the buffalo head.[27]

Once or twice a day, they would cease dancing in place, and would dance up to the center pole. JM says that if it was the Sun Dance leader who did so, his wife would come up on the dance floor, barefooted, with a leafy branch in her hand, and sweep away his tracks. But MT says that the dusting of the floor was done by an old man who came every morning furnished with an eagle feather for this purpose.

Furthermore, in MT's younger days, an old man would pick up a feather dropped by a dancer, tell why he had picked it up, and how he had once counted coup in a similar manner. Then the old man's relatives would present a visitor with something valuable—a stick representing a horse, or they might actually lead a horse in to the center pole (TC, MT).

Of this, JM says that if anyone lost a feather or the like, the war chief would come up and pick it up. He would tell how he had struck coup. For every coup that was counted, the drum would be hit once.[28] And for every coup counted, he would have to give away a different valuable, a blanket, or a stick representing a horse.

An old woman would then dance forward with a kind of trotting step, singing happily a special war song: *ke: de de* (meaningless). Then she would pick up the gift and say, "*ahɔ* (thanks!)[29] I am glad you have given this to me." If two old women started out at once, one would have to go back, but in case several articles were being given away, then they would dance up together.

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[26] It seems probable that the concept of a High Deity among the Shoshone was originally Christian, since they had earlier contacts with Christianity via the Comanche. Furthermore, Christian proselyting directly among the Shoshone dates back at least to 1834 (cf. Irving, 1848, p. 266, and De Smet, 1906, p. 138) the latter dealing with De Smet's teachings in 1841. Yet the wide distribution of the concept of a High God among primitive peoples calls for caution in such a derivation (Lowie, 1924, pp. 115–133).

[27] St. Clair mentions a blanket-shaking ritual immediately prior to the beginning of the dance proper, but this cannot be confirmed. Blanket shaking is an integral element of the Ghost Dance, whence it may occasionally be transferred to the Sun Dance.

[28] Also a common Crow custom (Dr. R. H. Lowie, personal communication).

This ceremony was also performed in the *piabɔŋgonëkar*¹, or Big Horse Dance.[30]

Formerly, each dancer had a regular sponsor, an old man who was given no special name, and who was nominated informally. He would urge on the young man, "Keep on dancing. Everybody's watching you; the women are watching you. If you drop, you might get a dream and Medicine." The old man blessed the young one at the end, but received no gift in exchange (MT, JM, DW, TC).

At times, one or two old women used to shuffle along, dancing with the help of their canes, singing a war song, urging the young fellows to be brave, not to give up. The song ended when the old women reached the limits of the secular part of the lodge.

As the night grew dark, a fire was started just east of the center pole by some noted warrior, who recited his war experiences while doing so. As it grew later, the dancers gradually quit, one by one, and rested, wrapped up in blankets furnished by their relatives. Only the plodding of some stout soul and the croaking of the tired singers kept active the course of the dance.

With the first rays of light, the dancers began to awake. More and more joined in until the whole ceremony was once more in full swing. Just before dawn, all lined up in a column of fours or fives, facing the east. The first tiny rim of the sun above the horizon was greeted by the stretching of arms toward it and long blasts on the whistles.[31] After that, the dancers sat around the fire and sang four sacred songs in low voices, blowing their whistles at the end of each song. Everyone else was silent at this time.

Following this ritual, the spectators and singers left the lodge for breakfast, while the dancers attended to their physiological wants, rested, and slept. Their fasting and thirsting continued unbroken.

In an hour, the dancers removed their old paint with the help of some damp skin, and repainted themselves, this time in any way they wished, usually following the directions of their visionary guardians.[32] Soon after, the dance was resumed, events repeating themselves identically up to the resumption of dancing on the second morning.

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[29] Also the Crow ceremonial thanks. These two tribes share many phrases of etiquette, for example, "Where are you going?" (Shoshone: *hagan mi'a'ʸᵘ*) as a formal greeting even though the person addressed may be sitting still (Dr. R. H. Lowie, personal communication).

[30] Lowie (1915 b, pp. 815–816) gives a brief description of the Big Horse Dance.

[31] The ritual of chest patting, called *naβaβukwi* by Hoebel (1935, p. 572) and found in the Hekandika Shoshone sunrise ceremony, is specifically denied by TW. Nor did I see it, although St. Clair mentions it. Probably this ritual is a feature occasionally borrowed from the *narayar*, or Ghost Dance, of which it is an integral part.

At that time the parents, wives, and other relatives of the dancers busied themselves in planting saplings in the ground within the sacred dancing ground (which they could enter if they removed their moccasins) (TC) parallel to the outer wall, then hanging skins from these to form little sheds, which were lined with armfuls of cooling grasses, sage, and fragrant peppermint through which a little water had been sprinkled. These skins were often painted with records of visions of war experiences, much like the back drop of elk or antelope hide inside a man's own tipi. War equipment was also hung up now. The dancers purified their bodies with cedar smoke (MT).

Some of the symbolism involved here is given by Hebard, after DW.

> Each dancer has a certain place in the dance hall which he must keep throughout the duration of the dance when he enters it. Two small poles or young saplings may be peeled off or not, whichever the dancer may wish. If the dancer is a medicine man or has been wounded in battle sometime, he should show this on the poles or saplings by painting them red, which signified his blood was lost in battle. [Hebard, 1930, p. 293.]

The third day was the most important one ritually. It was believed that one's fate in battle could be divined at this time (TC). Thus, if a man fainted, the Sun Dance chief would ask him, when he had recovered, whether he had had a vision. He might say: "I saw a fight. The Great Spirit told me that five or six men got killed; two or three of us. Our horses were stolen." This would come true (JM).

MT saw a man faint in the Dance. The sponsor came to the dancer and put his mouth to the latter's palms, throat, and soles of both feet. (Presumably to suck out the excess of supernatural power which had knocked out the dancer.) The sponsor took his buffalo robe and covered him carefully, with the head of the robe toward the dancer's head. (MT has never seen or heard of anyone dying in the Sun Dance; rather they would be cured.)

On the third day, spectators would also be prayed for, or have their illness brushed away by an eagle wing in the hands of the Sun Dance leader. He, or another, might also transfer Power to someone else during the day. The technique was not described, but probably corresponded to the one ordinarily used by the Shoshone, with the donor coughing up a supernatural object and blowing it through his hand into the recipient.

A man might also steal the supernatural Power of another, as Pohguritsie Taylor is reputed to have stolen Pivo Brown's. Then he would exhibit his acquisition by knocking someone over with a feather during the Sun Dance (PP).[33]

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[32] Lowie (1919, pp. 403–404) describes some designs of this sort.

Other shamanizing also took place. An exhausted dancer might hug the center pole, magically sucking water from it through his whistle (Lowie, 1919, pp. 395, 402). A man might send a feather in the air to the center pole (JM). (The supernatural balancing of a feather was used normally in shamanizing to predict the course of a patient's disease. If the feather insisted upon falling down, the prognosis would be very unfavorable (MT).) Further tricks were played. Thus Ohamagwaya, during his second Sun Dance, blew a whistle like an eagle. An eagle came down to the lodge, then flew up into the skies again. Following this, he struck his chest. Eagle claws came out of his mouth, then went in again. He vomited a bullfrog, then swallowed him again. He alone was able to exhibit animals like that (JM).

The dance ended in the afternoon of the fourth day; thus the dancers actually suffered but for 3 nights and 2½ days. The old man sponsoring the Sun Dance leader gave him his blessing at this time. The other sponsors followed suit with their protégés. Old men then brought water in which clay had been placed. Having done this, the old men recited their brave deeds.[34] Then the Sun Dance leader blessed the water, and only the dancers drank it. Some vomited.

The dance was now over, except for the feast on the buffalo tongues which had previously been collected. According to Lowie (1919, p. 397), before the dance "They began to hunt buffalo and get all the tongues they could. The tongues were coupled so that each member of a pair could hang over one side of a stick and several men would carry one end of a stick thus laden with tongues all around the camp till they got back to the pledger and piled up the tongues there." These tongues were, in the first Sun Dance MT remembers, boiled by two middle-aged women who painted their hands with charcoal, but stirred the tongues with an ordinary stick, not a scalp stick.[35] The Sun Dance chief asked for a blessing for the tongues piled in the hall by the fire. This was on the third day.

Quitan Quay insisted, however, that old women who had been in a war, up to four in number, cooked the meat just after the dance. They painted their hands and faces black, and used a broken stick to stir the boiling tongues.[36] PS said that the feast was on the last day, and that all ate outside.

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[33] Compare the ceremonial killing in the Kiowa Sun Dance (Scott, 1911, pp. 366–367). Such ritual shamanistic competitions are widespread, being found, for example, among the Kwakiutl and the Maidu. (See Drucker, 1940, p. 215 ff; Loeb, 1933, p. 160 ff.)

[34] Lowie (1919, pp. 399–400), states that the dancers gave presents to the old men blessing them, but later adds that this was a feature introduced by Rev. John Roberts, according to one informant. I also believe that this feature is recent; most likely, the old men counting coups now gave away property, as they did at other times in the ceremony. Payment to a sponsor would probably have taken place only when a transfer of supernatural power or a curing rite had taken place during the Sun Dance.

[35] Lowie (1919, pp. 398–399,) states that renowned old men also helped to stir the boiling tongues.

When the tongues were ready, a large group of boys, called Magpies (*kwïdaβɔi*) and painted with black and white in imitation of these birds, descended upon the old women and attempted to steal the tongues. The details of this ceremony are obscure, for informants' accounts differ.

For example, MT was a Magpie once. The other boys and he were led by three old men, who had gone through battles, and wanted the boys to follow in their path. Behind the youngsters were other men with switches. There were no prayers.

The spectators were now fed and told to hurry. "The Magpies are coming!" Then the Magpies were notified and came ahead. Since the people had not finished eating, the Magpies were driven back by guards also armed with switches. But the Magpies rushed in, trampling their own smaller and less aggressive members, and tried to grab all the tongues they could. Having done that, they ran back to the place from which they had started and piled up the tongues in front of the old men, who asked them to take a bath, and then fed them.

This ceremony was a symbol asking for a blessing that the boys be like Magpies, who are known to be fearless, going where other birds dare not go (MT).

Polly Shoyo says of this rite that the best parts were eaten by the adults, while the Magpies rushed for the less desirable tips of the tongues, which were piled to one side for them. (They were led by two old men, who counted coup on the pot, telling the people how they had hit the enemy.) "That's the reason the boys are with us: so they may do likewise." TC adds that the future luck of each Magpie was divined by his success in grabbing tongues.

CW described the Magpies as having been painted white on the forehead and shoulders. The two old men who led had drums, and sang. Two others with switches brought up the rear. These four men were the same from year to year. This suggestion of semipermanency is strengthened by JM's assertion that the Magpies were camp robbers, who stole food at public dances generally, and were almost equivalent to the two warrior societies.

Finally, QQ claimed that no one had ceremonial charge of the Magpies—they just tried to steal and eat food.

According to Lowie:

> The tongues were issued to all the spectators, but primarily to the musicians. The drummers told the dancers they were going to eat, then the dancers would

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[36] The stick, like all Shoshone food stirrers, could not be sharp-pointed, lest it pierce the meat, an extremely bad omen for any warrior eating this meat. Black is the color denoting victory in combat.

rest, while the drummers sang and themselves danced in their places before partaking of the food. [Lowie, 1919, p. 399.]

After all the eating was over, and the people had left, the dancers went to the river, drank, washed, went home, and ate there.

Meanwhile, sickly people brought in their old clothes and tied them to the center pole, so that they could be relieved as the dancers had been. These clothes were left untouched until they rotted away. Next morning all moved away from the site (Lowie, 1919, p. 399).

SOCIAL AND PSYCHOLOGICAL FACTORS

What evidence is available on the interrelations of the early Wind River Shoshone Sun Dance with other social and psychological factors? Can the introduction of the Sun Dance be ascribed to a peculiarly fortuitous time or an outstanding personality, or both? Did the dominant attitudes of the Shoshone, their pattern of culture (to use Benedict's term), promote, inhibit, or otherwise affect the acceptance and development of the Sun Dance? What tensions did the ceremony help to relieve? How close was the integration of the ceremony with the social structure and the system of values of the tribe? What factors were responsible for the adaptability of the Sun Dance to later profound changes, when many other cultural traits vanished? Let us examine these problems one by one.

Both a cultural crisis and a powerful personality may have aided the introduction of the Sun Dance. The period from approximately 1781 to 1820 was an extremely difficult one for the Shoshone (Shimkin, 1941). Prior to this period, their early acquisition of the horse had given them a temporary domination of much of the northern Plains. Beginning in 1781, however, smallpox, the mounting of other tribes, and especially the acquisition of guns by their enemies, placed the Shoshone at a military disadvantage. The Shoshone were forced from the Plains, and pursued by the Blackfoot even into central Idaho. A new ceremony designed to promote military success might well have received an especial welcome under such circumstances. Nevertheless, though the correlation is possible, it is unproven.

On the other hand, the prestige of the introducer, Yellow Hand or Ohamagwaya, is unquestionable. Traditionally, he far overshadows any other Shoshone, including Washakie. His abilities as a shaman are the subject of countless anecdotes. His dignity and his kindness to young men whom he pitied because of their lack of supernatural power are also renowned. Finally, if the Ama-qui-em mentioned by Ross is really he, then direct historical evidence confirms his importance and his outstanding personality (Ross, 1855).

The heterogeneity of the Wind River Shoshone unquestionably led to a wide variety of psychological outlooks. The differences between the old Plains families who formed Washakie's original band and the ex-rabbit-hunters who flocked in to share in the gains of the treaty of 1863 were enormous. Yet it is clear from informants' biographies, philosophical statements, and comments on others, that four dominant attitudes—egalitarianism, individualism, skepticism, and restraint—can be ascribed to the Wind River Shoshone.

The sentiment of egalitarianism was pervasive throughout Shoshone thought and culture. While individual qualities, particularly those of outstanding shamans, were admired, frank admission of leadership or control was begrudged. For example, jealousy of Washakie was marked, and many informants ascribed his rise solely to White aid, although, in fact, he was becoming prominent as early as 1843 (Russel, 1921, pp. 114–115). Chieftainship existed, but the chief's authority depended on his personality and his hold over his personal followers. The leaders of the two military societies and the shamans directing the Sun Dance and Father Dance were also persons with prestige, but here the list ended. Heredity, wealth, association, and age were factors in leadership in fact, but were stubbornly denied in Shoshone theory.[37]

Even stronger was the feeling of individualism. Beyond a man's immediate family, blood-brotherhood and the two military societies (these largely in Washakie's band) were the sole permanently organized groupings. Larger kin groupings lacked sentimental ties, special associations of age mates or of shamans were absent, and band affiliation was a matter of free and shifting choice. Legal control over individual actions extended only to the rules of the buffalo hunt; otherwise, reprisal through force or sorcery was the deterrent to wrongdoing. Religious life was basically an individual matter. The Sun Dance, the Father Dance, and other ceremonies, as well as the transfer of supernatural power, provided social links. But more fundamental were the solitary vision quest and, above all, the medicine dream life that could scarcely be separated from reality. The quintessence of Shoshone individuality was reached in the individual tabus, which crystallized and sanctified idiosyncracy with supernatural power.

Closely related to extreme individualism was critical skepticism of the pretensions or dogmatic assertions of others. Guy Robertson's rejection of an abstract God and Charley Nipwater's disbelief in the hereafter are modern illustrations of this attitude.[38] This skepticism did not, of course, mean the absence of religious or philosophical formulations or abstractions: most people held to beliefs in a Heavenly Father, in vistas opening out at death, in pervasive Supernatural Power—but acceptance of these beliefs and their reconciliation with other, contradictory, beliefs were matters of individual choice guided by personal experience.

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[37] Compare Comanche attitudes, cf. Hoebel (1940, pp. 6, 11–12).

[38] Shimkin (1942); also compare Shimkin (1947 c).

Another characteristic Wind River Shoshone attitude was restraint, which contrasted sharply with the emotional extremes found, say, among the neighboring Crow or the Dakota. (Lowie, 1935, esp. pp. 327–334; Mekeel, 1936, pp. 11–12; Marriott, 1945, pp. 101–111.) Sexual behavior was quite free, and marriage often unstable, but oscillation between organized wife stealing on one extreme and public demonstrations of chastity on the other did not exist. Renowned men were expected to recite their deeds, then give away a horse or other valuable on various occasions. But for them to strip themselves of everything they owned in celebrating their renown, would have been ridiculous, not praiseworthy, in Shoshone eyes. Among the Shoshone, as among other Plains tribes, men would voluntarily doom themselves to death through reckless folly against the enemy. Men who had lost a brother to the foe might dedicate themselves in this manner. But doctrines of the praiseworthiness of early death in battle, involuntary selection of "Those Doomed to Die," and similar elaborations did not exist. Foppery also was to be found among the Shoshone, but the institutionalized narcissism of the "Favorite Child" was not. Finally, the Wind River Shoshone had the vision quest, yet it involved only sleeping by pictographs or near a shaman's grave for a few nights. Piteous self-mutilation and fasting almost to the point of death were equally foreign to their practice.

What was the effect of these attitudes upon the development of the Sun Dance? Direct proof is not available, but it seems most probable that these attitudes greatly inhibited the acceptance of many traits from the Sun Dances of neighboring tribes. Shoshone egalitarianism goes far in explaining the absence of formal heredity in Sun Dance leadership or of payment for the privilege of giving the ceremony, and the nonparticipation of the military societies in the rite. Individualism and skepticism help comprehension of the absence of a shamanistic fraternity despite the repeated participation of a few and also of the absence of complex esoteric doctrines. The Sun Dance may well have reflected Shoshone restraint not only in its lack of torture but also in its absence of a single, all-pervading purpose and of an intense emotional peak in the ritual.

The Sun Dance had only a loose formal connection with the social structure of the Wind River Shoshone. The bands, the band chief, and the military societies lacked prescribed functions. Kin had no obligatory duties toward each other in the ceremony. On the other hand, all age groupings, children, adults, and the aged, were represented, while shamans dominated the rite.

Informally, ties with the social structure were generally closer, although much depended upon personal attributes and attachments. Thus, while Andrew Bresil was apparently a person of no consequence except for his position in the Sun Dance, his father Pa:si was an extremely important shaman and one of Washakie's subchiefs, although not a leader in either of the military societies. Yellow Hand, of course, combined religious and secular dominance since he was one of the two principal chiefs of his day. Similarly, the strength of various personal ties could be proclaimed discreetly within the context of the Sun Dance. Sweethearts might ride double on a horse from the tree-felling ceremony. A man's wife or an old male friend or relative might perform tasks of aid to a dancer, such as building his shed, or sweeping the dance ground with a feather for him. An old man might transfer supernatural power to his younger intimate. Father and son, brothers or blood-brothers, often danced together.

The most important social value brought out in the Sun Dance was individual prestige, either as a warrior or as a shaman. Prominent warriors performed essential rites and recited their deeds at countless points of the ceremony: when the hole for the center post was dug, in killing the buffalo, painting the center pole, lighting the warrior's fire, picking up dropped articles from the dance floor, and leading the Magpies. Individual ability and prestige as a shaman were established by the performances of rival supernatural feats, curing, and the transfer of Power.

War anxieties, however, demonstrated their strength beyond the rubric of individual prestige. The sham battles, the hanging of war equipment in the lodge, war divination, tongue cooking by black-painted old women who had been in battle, and the Magpie ceremony showed the ubiquitous character of this preoccupation with war.

Concern for health was also prominent. Threatened illness forced the leader to give the Dance. The sick were often laid in the lodge, and curing took place during the ceremony.

The acquisition of supernatural power, good luck, and long life were also promoted by the Sun Dance. Beyond this, other values expressed in the rite are not so easy to establish. A great variety of them is suggested by the simple fact that this occasion, and a few weeks that followed, were the sole times that the entire Wind River Shoshone people habitually came together. Thus a whole set of cohesive influences would now begin operating: gossip, and the identification of wrongdoers, flirtations and marriages, gambling (most of that later, at the rendezvous with the trappers), racing, initiation into the military societies, etc. There were the relaxations of joyous company, sufficient food, and, generally, safety from the enemy, which contrasted strongly with the painful days of winter. Visiting Dɔyahin enlarged the gathering, and often proved a source of profit to Shoshone businessmen who bought their furs for later resale to white traders.

How important were the values revealed in the Sun Dance in the totality of Wind River Shoshone culture? What other mechanisms were available to accentuate these values? What major values and anxieties were unrepresented in the rite?

The overwhelming importance of individual prestige has been stressed in the discussion on dominant Shoshone attitudes. In addition to the Sun Dance, many other social patterns advertised personal achievement. The dances of the military societies, young men's songs, distinctions of face and body paint, and of dress; tipi decorations and medicine-bundle stands outside tipis—these marked the prominent warrior. Individual curing and leadership in the Father Dance or Ghost Dance marked the shaman. Yet none of these mechanisms had the effectiveness of the Sun Dance as a vehicle for prestige.

Military prowess was at all times vital. All the witnesses from Lewis and Clark to E. N. Wilson have stressed the extreme pressure often exerted upon the Wind River Shoshone by their enemies (Thwaites, 1905, vol. 2, p. 434; Wilson, 1926, p. 92 ff.). Yet only one of many old warriors' accounts claims the exhibition of great courage, and that, on occasion only. Most of my informants admitted frank fright in combat, and distaste for war. Consequently, devices for raising and maintaining the morale of the tribe were highly necessary for its very existence.

In general, war and prestige shared many of the same devices. The two military societies gave dances, and adorned themselves in striking special ways. Even a man's tipi—inside and out—would give visible testimony of his prowess in performing standardized acts of bravery or "coups." The women honored a successful warrior by dancing with the scalps he had taken. And a youth—unless he were a handsome fop—needed deeds of war to gain himself a wife. Little boys played at war by slinging gobs of mud from the ends of sticks at each other.

The anxiety about the outcome of battle was often acute. As Polly Shoyo, or Pɔpɔˇi, says, "There was more respect and affection in the old days than now, for we never knew when would be the last time we would see each other—what with enemies, hunger, and other dangers." And her accounts bring out the pathos and emotional intensity often observable in those days.

> Once, we fought with the enemy, and the enemy killed a young Shoshone, the grandson of an old woman. Then we followed them, and met them, killing one of their number. This man's body was taken back home to camp, as the enemy fled.
>
> Because the old woman was still crying, the warriors gave the body to her. Still mad with grief, she took a knife, slashed the body, butchered it like a buffalo. She took the slabs of meat, and dried them on a frame. But the meat was left untouched.

When we moved camp, it remained behind. It may still be there, for all I know.

The means of lessening tension were many, but unorganized save in the Sun Dance. Relatives—such as the father of the warrior in the tale of "The Weakling and the Female Bear"—would attempt to dissuade their loved ones from foolish war raids. Men would try to gain the Power of such animals as Turtle, which would grant invulnerability.[39] Or they would brave the deadly *dɔ'yaratuwara* plant, overcoming it to gain power in battle and in sorcery.[40] While warriors would be on the warpath, the old men at home would help them supernaturally by singing war songs to the beat of a drum.

Illness was a drive of great importance in the lives of the Wind River Shoshone. Even in ordinary times, some women lost 9 out of 10 children born to them, while men describe the deaths of 4 and 5 wives. In addition, severe epidemics, principally of smallpox, ravaged them at times, as, for example, in 1781 and 1837 (Tyrrell, 1916, pp. 335-337, 344, footnote 1; Farnham, 1906, p. 266, footnote).

The Sun Dance was in those days a comparatively minor curing device. Much more constantly used were the services of shamans and their assistants. And during severe epidemics the Shoshone held the *a'p:ënëkar*, or "Father Dance"—a close relative of the Ghost Dance of later days.[41]

Exhibitions of shamanistic power took place on irregular informal occasions outside of the Sun Dance. They were very rarely competitive. The settling of grudges was usually recognized ex post facto.

The extent of social cohesion among the Shoshone differed widely. Some families stayed by themselves, fishing, hunting, and berrying in isolated spots. Others were much more sociable, staying regularly in one of four large bands (Shimkin, 1938 and 1947 b). But members even of these groups might leave on excursions lasting 2 years or more, ending hundreds of miles away. In the summer time, after 1825, however, the Shoshone would gather to meet the trappers and several other Indian tribes. Outside of this and the Sun Dance, there were no regular unifying mechanisms except the personalities of chiefs, the military societies, the summer buffalo hunt, and the danger of annihilation in battle.

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[39] For example, see Olden (1923, p. 92 ff.).

[40] The plant is unidentified, but is a mountain species; *dɔya* (mountain)—*datu* (?)—*bada* (or *wada*, seed plant); it has red, yellow and blue flowers; the leaves turn brown; the root is used. The Gosiute *to:-ya-da-ti-bu-da* is "?*Primula parryi* Gray. Primrose? *Polygenum viviparum* L. *Gnaphalium sprengeli* Hook and Am. Cudweed." (See Chamberlin, 1911, p. 400.)

The beliefs concerning this plant resemble those about Peyote to a surprising degree. Prominent features are its location by an exceptionally high will-o'-the-wisp, prayer to it, and counting coup on it; visions in which it comes as a person; use to kill animals by placing it in their tracks; use to kill persons by mixing their hair with it, then burying this mixture.

[41] The Father Dance and the Ghost or Round Dance (*narayar*, literally shuffling) are basically the same ceremony. It is initiated by a shaman who possesses mystical songs of a fixed melodic structure, which refer to his dream experiences. A cedar is placed upright in an open plot of ground, and a brush enclosure is built around it. The shaman stands by the center pole, and the dancers form a circle in which men and women alternate. They clasp hands and shuffle sideways. At the end of each dance, they shake their blankets to shake away illness.

This ceremony may be undertaken primarily as a social dance or as a religious one. The special features and the specific purposes of the religious dance vary greatly according to the supernatural power and instructions of the shaman. Some had power over food, others over smallpox, etc. In the religious form of the dance, Our Father was addressed in prayer by the shaman, whence the name.

The Ghost Dance of 1890 among the Wind River Shoshone was thus a minor variant of this well-established pattern. The concept of the return of the dead was the sole special feature. (See also Lowie, 1915 b.)

Games of hand, hoop-and-pole, races, shinny, and many other diversions existed among the Shoshone, but none of these, except occasionally the hand games, competed with the Sun Dance in terms of size, activity, and color as public attractions. The social dances served to enhance the prestige of warriors, or to afford pleasure, or to shake away illness. Most served as a prelude to sexual intercourse, quite openly in the case of the *na'ʒomɔyɔg.*[42]

This finally brings up the values in the kinship structure implied in the Sun Dance. Interestingly enough, almost no formal ceremonial relations between kindred comparable to those among other Plains tribes existed among the Wind River Shoshone. At most, a wife, unless menstruating, would carry her husband's medicine bundle in travel. Or a father would bequeath supernatural power to his son. Consequently, the few emphases on kinship ties existing in the Sun Dance were relatively important.

Thus the Sun Dance had significant social and psychological functions. Yet it was far from being a fully effective integrating device. Concern about food and about general welfare were not brought out as they were in the Father Dance, a ceremony which had much more emotional appeal to many of my informants (especially PP). Neither grief nor worry about the hereafter were relieved by the Sun Dance. Even the values emphasized were not developed to the maximum degree. Certainly, the warlike features of the Wind River Shoshone ceremony were but pallid contrasts to the grim purposefulness of the Crow ceremony (Lowie, 1915 a). The few participants striving to gain supernatural power through mild hardships among the Shoshone were but half-hearted equivalents to the echelons of novices enduring torture among the Dakota (Walker, 1917).

If the Sun Dance was inhibited in its development of social and religious elaboration, if it expressed Wind River Shoshone values and social structure but incompletely, why was it able to withstand profound change with the advent of reservation days? Why did this instrument succeed in integrating the group far more closely after the shock of acculturation than in nomadic times?

No categorical answers can be given, but one set of facts stands out. In the crisis of 1890, tribes with well-integrated Sun Dances such as the Arapaho, Cheyenne, and Dakota seized upon an alien rite, the Ghost Dance of the much-despised Paiute, as the agency for crystallizing their anxieties. As Mooney writes, "The Ghost Dance practically superseded all other dances among the Cheyenne and Arapaho. . . ." (Mooney, 1896, p. 901). On the other hand, the Ute, who had other functionally well-adapted ceremonies (the Deer Hoof Rattle and Round Dances), slighted these to take up the Sun Dance at this very time (Opler, 1941, pp. 570–571). The Wind River Shoshone took up the Ghost Dance—long familiar to them—for a brief period, lost enthusiasm, and then concentrated their energies on the Sun Dance, Peyote cult, and Wolf Dance. In all cases, there appears to be a correlation between the prior, close functional integration of a ceremony and its psychological rejection at a time of overwhelming crisis. Thus it appears probable that the very feebleness and lack of cohesion of the Wind River Shoshone Sun Dance were important influences in its survival and further adaptation after 1890.

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[42] Lowie, 1915 b. A more refined name is *na'ʒonĕkor.*

THE MODERN SUN DANCE

THE LATER HISTORY OF THE SHOSHONE SUN DANCE

By 1880, or thereabout, the Wind River Shoshone Sun Dance had begun a period of change which culminated in essentially the modern form of the dance by 1905. The principal modifications at this time consisted of a marked growth of Christian or pseudo-Christian ideology within the dance, the diminution of war-centered elements, the great development of connections with social (ultimately, curing and social) functions, and the increasing use of White goods—shawls, wagons, etc. Concurrently, however, the repressive efforts of the Indian Service led to disguise and subterfuge in regard to the entire institution. For example, the Indians, forbidden to hold religious ceremonies, dubbed this the "Sand-dance" or "Half-dance," and claimed that it had only a social or recreational value (Le Sieur, 1911).

This state lasted until approximately 1920, when the relaxing of restraint allowed the shaman Morgan Moon—an enterprising man who had experimented with the Peyote cult at one time—to revive the dance openly. Since then, the dance has been maintained by the entire Shoshone community, and has been given annually.

The modifications since 1920 have been minor and largely connected with the increasing influence of the tribal council upon the Sun Dance. In fact, the tribe has stubbornly rejected some innovations. Thus, in 1920, Morgan Moon wanted to dance 4 days. The others insisted upon their habitual 3 days and 2 nights. Again, the same man claimed in 1936 that a visionary power had told him to have the center pole bare of the willow bundle and buffalo head, and to reorient the entrance to the lodge from the east to the west side (TC). So, although he was not allowed to change the entrance, he put on the Sun Dance with the pole bare. But public distrust of the efficacy of his performance was so great that the informal ceremonial committee meeting at the gambling games induced the medicine man Natopo White, despite the fact that he had had no vision, to give a second Sun Dance a few weeks later. They paid him $10 and gave groceries to his family in the meantime. As a result, he took Tom Compton as his assistant, and held a fairly successful dance, with 46 participants.

The history of changes in particular elements of the dance is reconstructable to a good degree. Thus, it is probable that the old style of dancing-in-place and its accompanying ceremonial sweeping of the ground disappeared by 1880, as it is unknown to my younger informants and both St. Clair in 1902 and Lowie in 1912 reported the new style of dancing to the center pole and back (Lowie, 1919, p. 395; St. Clair, appendix 1). Since the last disturbances in the Wyoming-Idaho area were in 1878-79, among the Nez Percé and Bannock, it seems probable that the abandonment of war divining, of placing military equipment in the Sun Dance lodge, and of prayers for success in war came shortly thereafter (Report of the Secretary of War, 1879, p. 90). In 1884, the Shoshone killed a considerable number of buffalo for the last time.[43] Consequently, this dates the disappearance of the ceremonial buffalo hunt, the feast on tongues, and the Magpie ritual. The greatly increased concern over illness and communal unity in the Sun Dance probably goes back to the period of intense misery and dissension of the late 1890's (Shimkin, 1942).

The intensification of Christian influence, including the introduction of 12 outer posts identified as Christ's Apostles, with Christ Himself being represented by the center pole and with the entire ceremony being derived from His fast, can be assigned to the period 1885–90. Clark's description of 1885 mentions 10 outer posts, yet at the time of the diffusion of the dance to the Ute (ca. 1890) and to the Hekandika (ca. 1906) these concepts were obviously already firmly set among the Wind River Shoshone.[44] Furthermore, the founding of both the Episcopal and Catholic missions at Wind River took place in the 1880's. Direct influence from the Episcopal mission is indicated by Lowie's statement that the Reverend John Roberts introduced dancers' payments to their sponsors (Lowie, 1919, p. 400).

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[43] Five hundred bison robes procured in 1884, 10 in 1885. (See Report of the Commissioner for Indian Affairs, 1885, p. 183, and 1886, p. 211.)

[44] Clark, 1885, p. 363; Hoebel, 1935; Opler, 1941. The last two are sources for all references to the Hekandika and Ute, respectively.

According to my informants, the Sun Dance doll disappeared shortly after 1900 (GR, MT); this is confirmed by the presence of the doll among the Ute and its absence among the Hekandika. Dancing the *narayar* ("shuffling," or Ghost Dance) dates to at least this period, although it has been an irregular accompaniment (GR). Ute and Hekandika data again provide confirmation, since it is absent among the former and present among the latter.

A few changes may be ascribed to the period, roughly, of 1906–15. The elimination of clay from the water drunk at the end of the ceremony, and of the ritual vomiting may be dated from the facts that these elements are present among the Hekandika but appeared to have disappeared from Wind River at the time of Lowie's visit in 1912. The rise of the ceremonial number two—two leaders, two files of dancers circling the hall twice before entering, pairs dancing together—may be a loan from the Shoshone Peyote cult, in which the number two is also important (for example, one may eat two buttons rather than four).[45] The Peyote cult was introduced prior to 1900, but did not achieve a strong footing in the community until after 1915. This cult may also have had its effect on the Sun Dance by increasing emphasis upon prayer rather than the recitation of war deeds. Thus, since about 1915, the old man bringing in firewood has prayed rather than counted coup (TW, GR).

The recent history of the Sun Dance is but part of a period of far-reaching changes among the Wind River Shoshone (Shimkin, 1942). After a collapse of the old nomadic life in the 1880's, a small number of young men, Tassitsie, Bishop Wesaw, Wanabïdi, and others, reworked the entire religious and social culture of these people, through numerous loans, inventions, and modifications. They revived the military societies and instituted new dances. They vigorously embraced the Episcopal church and the Peyote cult. They reworked the Sun Dance into a stable reintegration in the new life of the reservation. Unlike the extinct Father Dance, vision quest, medicine bundles, individual tabus, and menstrual hut, the Sun Dance had the vitality not only to survive modification but to gain increasing popular faith and support in recent times.

THE MODERN SUN DANCE—GENERALIZED VERSION

The inception of the modern annual Sun Dance is somewhat as follows: During the winter the Indians meet frequently to gamble at Stewart's store. A vaguely hereditary group interested in ceremonies (the *a:no* or "Horn-Packers") begins to formulate plans.[46] Somewhat by their consent, somewhat by private initiative, one of the men who has participated in the Sun Dance many times and may have led it once or twice before, then announces his intention to lead it the coming summer. He picks out a friend, also a regular participant, as assistant Sun Dance leader.

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[45] Cf. Shimkin's element list in Stewart (1944, pp. 103–121).

[46] I could not get detailed information on the composition of this group, but it appears to correspond closely with the Wolf Dancers discussed in the interpretative section of The Modern Sun Dance.

A dream is the invariable sanction of the claim to leadership.[47] Thus, in 1938, TW saw, in his sleep, a really old man with gray hair, dressed in a buckskin suit, who told him: "You will put up the Sun Dance with Ben Perry. You will pray for the tribe and the sick ones in it. You will pray for Leslie Isis. If you don't mind me, you will sicken and die." He came thus twice. PT's dream in 1937 had an escape clause in it. A dead friend of his, whose Sun Dance whistle, feathers and eagle-wing fan Pohguritsie Taylor still possesses, came to him in the night, telling him to hold the dance. He stipulated, however, that if someone else gave the dance he would be released from his obligation! (JM.) Furthermore, even mere participation may be forced by a dream. In 1936, Toorey Roberts had a dead man come to him thus, telling him that he would die or have deaths in his family if he did not join the Sun Dance that year. Bob became the Sun Dance chief's partner then (TC).

Yet, curiously, rivals for leadership insist that their opponents have no such dreams as they claim for themselves. One claimant stated: "Tom Compton had no dream—he gave the dance just for the money—just for the fun of it." Tom Compton denied the validity of another Sun Dance leader's dream in similar fashion.

Once his claim to lead the ceremony has been publicly recognized, the Sun Dance leader appoints the head of the Sun Dance committee, the latter naming in turn three or four assistants and two special police. The group of men so formed, among whom are always several members of the tribal council, takes charge of the finances, public order, and other details of the dance. They haul logs for the lodge on Indian Service trucks, help in its construction, assign the soda-pop concessions and perform police duty.

They raise money for the Dance in a number of ways. Committee members station themselves on the road to the Sun Dance, and take 25 cents admission from each individual, White or Indian, in the automobiles that come in, as well as "donations"—varying from $1 to $5—from camera-carrying tourists. The number of the latter is usually not very great, despite announcement of the Dance over the radio. A last important source of money are the two soda-pop stands which are built north and south of the entrance to the Sun Dance hall. These do a roaring business. The total proceeds, which sometimes amount to $300 according to a highly optimistic statement, are used largely to defray the costs of the feast at the end of the dance. In addition, the committeemen pay themselves $2 a day, the policemen, $2.50. Where the rest of the sum—if any—goes, I do not know.

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[47] Such dreams are equated to visions, and regarded as completely different from ordinary dreams. They are the results of long concentration on the subject and thus are absolutely clear, perfectly remembered, while dreams proper are generally confused, absurd, hazily retained (TC, TW, PT). This differentiation has some general interest (cf. Kroeber, 1940, p. 207).

A week or more before the start of the dance in July, the prospective Sun Dance leader moves his tent out on the "Sun Dance field," a large open plain about 2 miles southwest of Fort Washakie. Its long-continued use for these ceremonies is attested by many old center poles which stand there.

Three or four days before the time scheduled for the start of the public part of the dance, the leader goes, in the morning, with one or two old men to dig the hole for the center pole. They align this hole 150 to 250 yards, due east, by the sun, of the Sun Dance leader's tent, but without regard to the position of that of his assistant, if any. Then, often without any preliminary prayer, they dig the hole, a crowbar generally serving in lieu of a digging stick. Once finished digging, they return home without further ado.

Usually on the same day, the Sun Dance leader, accompanied by eight or nine men, at least one of them an old warrior, drives a wagon to get the center pole. He normally selects one of the fine cottonwood trees on the river bank near the Agency. Then, before the men start chopping, all stand by the tree and take off their hats, while the leader prays (in TW's words): "The Creator has created this tree. I pray there may be no suspicion in this dance. We are humble and don't know anything. I ask you, Creator, to bless us so we may live until old age."

Quitan Quay gives a somewhat different version of this prayer:

īgači	ëna'nišundheηgën	në	ëwuka'handɔ	īm
Now	/ to you-(I)-am praying	// I	/ you-cut down-will	// By means of you

në	na'nišundheηgën	ʒaηk	në	na'nišundheηgën	tų'iwičanë
I	/ am praying	/ well	// I	/ am praying	/ (that) / youths

ënšu'ndhaindë	nīwiča	në:'cigwa	ëηkhaind	ʒana'han
you-bless-will	// Person	/ sick	/ you-by-means-of	/ make well!

uš	mbeš
That is	/ the end /

Freely, "Now I am praying to you. I will cut you down. By means of you I am praying, praying well: You will bless youths. Make a sick person well through yourself! It is the end."

The old warrior now hits the tree with a stick, killing it. The others chop down the tree without further ceremony.

A similar ritual is performed for the east-running pine rafter, dubbed "backbone" by JM, "chief" (*tegwahin*) by TW. The rest of the necessary timbers and brush occasion nothing of this sort, however, and may be brought to the Sun Dance field by Government trucks without ceremony.

During the next day or two many tents are set up on the Sun Dance field. Visitors come from afar: Arapahoes, Bannocks, Utes, Cheyennes, and members of other tribes. Finally, at the appointed time, all dress up in their best, preferably in native costumes, and mount their horses. As the morning continues, they take their posts for the sham battle. The young men gallop in the hills whooping and yelling. Some old women sit quietly in their old-fashioned saddles, waving sagebrush branches. A number of old men guard the lumber, which has already been piled on the field.

After some show, the Sun Dance leader's party attacks the guards; and either he or someone of his old warriors strikes the center pole. A picked herald—an old, distinguished warrior—announces the achievement of this to the spectators.

All now dismount and, with the help of wagons, move the logs close to the site of the Sun Dance lodge. This having been done, the Sun Dance leader prays by the side of the wood.

Shortly afterward, the construction of the lodge begins. A number of men measure the radius of the planned structure with a rope, then locate the holes for the 12 center posts. These posts are now lifted and tamped into place. Then the rafters are measured and marked, while their tips are lifted onto the forks topping the side posts by means of joined poles. The east-running rafter remains on the ground.

The center pole is now prepared. Previously, anyone who could, got the necessary buffalo skull, eagle, and willows without further ceremony. A skin is generally pulled over the skull to imitate a bison head. (In 1938, however, the dancers borrowed a large mounted head from the Government Day School.) Then this is painted with white clay, and eyes are inserted, with yellow paint adorning the eyes and nose. Sage (*Artemisia*) is stuffed up the nose; the sagebrush is supposed to be a strong, healthy plant, and its purpose is to bring a long, healthy life (TC).

The center pole has been brought into the center of the lodge, and now lies west of the excavation, with the fork pointing west. The Sun Dance leader obtains at this time a large bundle of leafy green saplings and lashes it underneath the center pole, at the fork. The buffalo head is placed on top of all this, and lashed on in turn. Meanwhile, one or more distinguished old men paint bands of black around the base of the pole with charcoal. A white rag is then tied to the fork on the left of the buffalo head, and a blue one on the fork to the right.

Now a herald assembles many men to lift up the center pole. Eight of them hold sets of poles joined by ropes, there being four such sets altogether—two long and two short ones. Then the men start singing a fixed sacred song without words in a low voice, those with the poles keeping time by hitting them together. When the leader has given the word, the pole is lifted, then lowered again. This happens twice more. The fourth time the song is much louder, and all strain now to lift the pole successfully into place. This is done, and the pole, having been raised upright, is rotated so that the bison head faces west. Then earth is tamped down around it, although the small pile of rocks and the digging stick (or crowbar qua digging stick) are left undisturbed by its base.

Following this, the east-running or chief rafter is put into place, but without singing or feinting. The raising of the west-running rafter comes next, then the south-running and north-running ones; others follow irregularly. The roof poles between the side posts are installed next in a counterclockwise series beginning on the east side. Then large tree branches are leaned against the side roof poles to form a thick wall with an opening only on the east. The lodge is complete.

The modern symbolism involved in the Sun Dance structure is as follows: The number of black charcoal bands painted on the center pole corresponds to the number of full days that the Dance lasts. Thus in 1937 there were two (JM, MT). In Tom Compton's words:

> The Sun Dance started with Christ's fast and stay in the mountains. It was carried on from then to today, and is nearly the same now as it was a hundred years ago. Christ's fast was for 12 days [sic], he had 12 disciples: today the Sun Dance has 12 poles symbolic of this. The buffalo head on the center pole represents the game furnished by God; the eagle, the game birds; the "willows" [leafy branches], Holy Water that Christ made in the mountains.

Quitan Quay believes that the center pole symbolizes the crucifixion of Jesus, the 12 poles standing for the Twelve Apostles. One hopes to get good luck from the eagle on the east-running rafter, which in itself is meaningless. TW agrees with him.

The prayer songs that are sung when the center pole is lifted into place ask for help from the Spirit that the Dance might be successful, that the participants might have long lives—just as the center pole has had one.[48] The raising of this pole must be done by hand, and without the use of iron (TC).

Of all this, DW says: in putting up the center pole, the Sun Dance chief prays up to the sky first. "Father, pity me, so that I'll live a long time." He does not know the deity prayed to. Other concepts of his are stated by Hebard:

> The center pole, which should always be a cottonwood, was chosen by the originators of the dance because of its superiority over all other trees as a dry-land

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[48] The "Spirit of the Sun Dance" is Tom Compton's private concept, so far as I know.

> tree growing with little water or no water. This tree represents God. The 12 long poles that are placed from the top of the center pole down to the circumference of the dance hall represent, according to our Indian beliefs, the 12 apostles of God, our Father.
>
> The eagle feathers at the top of the poles above the center pole also represent the 12 apostles of our Father, or God, and also being a sacred bird of our race, we Indians naturally regard the eagle with the highest esteem. The buffalo head in the crotch in the center pole represents a gift from God, our Father above, to His Indian children for food and clothing. [Hebard, 1930, p. 293.]

During the late afternoon the prospective dancers begin their preparations. They bathe. Then, either at home or in the Sun Dance leader's tent, many paint themselves from the waist up with white clay, which may be got from anywhere, is not prayed over, but merely mixed with water and put on (TC, DW). This white clay is the main paint of the Dance, because it will dry the flesh quicker than any other. Any sickness will thus be dried out. Other paints won't do that (TC).

Each morning after the dance has started, the participants wipe off the paint with a damp cloth. Now they may put on any color of paint they wish, according to their visions (TC). Yellow is common. Some dancers, however, use no paint whatsoever.

From the neck of each Sun Dancer hangs a single-holed whistle of eagle humerus (no other bone may be used), with an eagle pinfeather attached beneath its further end (fig. 21). In recent days a section of inner tube often replaces the strip of leather tied around the mouth of the whistle to keep the lips from cracking. The whistle is kept from year to year, may be inherited, but acquires no supernatural power in this fashion. It serves merely to dry out the body, to dry out disease from the body. There are no prayers connected with its manufacture (TC).

To each little finger is tied an eagle down-feather, which has the same significance as the eagle on the east-running rafter (TC).

There is nothing held in the hands at the beginning of the Dance, but the dancers may have a tobacco pouch with them, a pipe and tobacco, or common cigarettes. Dreams or other supernatural sanctions give tobacco special meaning to particular individuals, though not invariably. Yet in the ceremony as a whole, tobacco has no special significance, nor does it have to be smoked in any ritual manner. The dancer merely sits down to smoke, or goes in another's stall to do this in company.

The dancers are naked except for an ankle-length skirt of light calico, furnished with a drawstring, and suspended from a beaded belt. From the same belt also hangs a fancy apron, covered with beads, ribbons, and the like. Neither skirt nor apron involve any symbolism. The feet are bare. The hair is not especially dressed (TC), although those with long, braided hair often intertwine strips of ermine or other fur. Around the head and waist *Gnaphalium* is still often placed, contributing only its aroma, but no supernatural help (DW). Friends and relatives bring blankets in which the dancers wrap themselves when they rest.

When night has fallen the dancers who are ready gather by the Sun Dance leader's tent—in which no esoteric rites have taken place (TC, TW). They form one or two files facing west, the number being determined by the number of leaders, who head them. They then strip off their blankets and step forward gingerly, blowing lengthily on their whistles. They march to the west end of the lodge, then around it clockwise once, twice, or four times (according to different informants and observations) before entering. If there are two files, these split upon reaching the west end of the lodge, and pass each other on the east, as they keep circling it.

Some men, who have been working, or in the mountains, might not be ready on time. Such persons may join the dance up until the first midnight. No one is asked to join the dance (TC); everyone goes in solely on his own initiative.

The causes for entrance I will discuss fully in my interpretative section. Here, however, it is well to give some of the stated purposes. All stress the importance of the ceremony for the public good. "The dancers are suffering for everybody, for all human beings—just like Jesus" (TW). The gaining of supernatural Power is stressed by some, for Sun Dance visions are the most common means of getting it (PT). Many shamans use Sun Dance songs for curing. Others, particularly those whose primary religion is Peyote, underscore the difficulty of such an achievement. "We were not dancing for Power—they only got Power long ago" (TW). "They don't try to get Power in the Sun Dance—it's almost impossible—usually unnecessary. You should be humble. When they go in, it's for the good of everyone" (GD).[49] Still others wish to supplicate for good health and long life, or sometimes to cure specific diseases, rheumatism especially (TW, BP).

Once the dancer has joined, he is kept in the dance, and his conduct is guarded. Everyone, including the special police, watches that he does not eat or drink. Even if he were to sneak to the camp, the people would send him back hungry and thirsty. Unless he dives into the creek, he can get no water (TC).

When the dancers have entered, they go to the west half of the lodge and take whatever places they choose, except that the leader stands directly under the east-running rafter, his assistant beside him. The leader now goes up to the center pole and prays. According to one informant (DW), he and the other dancers may first sit on their heels in their places and sing their four prayer songs.

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[49] These arguments are in accordance with the general Peyotist religious attitude. Compare also La Barre (1938, esp. pp. 93–104).

The singing now starts. The performers occupy the southeast quarter of the building. They consist of 10 or more men seated around a single large drum, which they beat with padded sticks; helped by more than a dozen women who sit nearby, rythmically waving willow branches up and down. One man, sitting east of the drum, holds a rattle of rawhide (formerly, buffalo scrotum) with stones inside, a feather from an owl or other bird tied to its end, and a cloth-wrapped handle (fig. 21). Watching the dancers, the rattler regulates the tempo of the music. For, although all dance in the same cadence, their steps are of different length, and it is the rattler's job to see that the song continues until the last dancer has returned to his place.

There are no rites connected with the singers, who are merely those who know the Sun Dance songs. Their number is indefinite. The best of them leads. There is some singing all the time (except during the breaks after the morning rite), but one party releases another after an hour and a half or so. This is hard work, nearly as hard as dancing, for they must strain their voices continuously. (DW thought their work easy. He said that individuals might drink and eat, leave at any time they felt like doing so.) But, inasmuch as fine singers such as Logan Brown are well recognized, considerable prestige may accrue. Consequently, singers often visit from afar. Thus, one orchestra in 1937 consisted of two Shoshone and eight Bannock and Ute; on the other hand, Logan Brown went over to Fort Hall to sing in the dance there.

The music is started softly by one man, not the rattler, accompanied by four or five others, as well as by the gentle beating of the drum. The melody is invariably sung in a strongly nasalized voice. The melodic structure seems essentially simple, a constant lowering of pitch from the shrill beginning to the low and heavily glottalized end of a measure. After several preliminary measures, five slow, ponderous drumbeats are given. The song now issues forth in full volume, and somewhat faster than before, with about 160 beats to the minute. The women now have joined in, but their song goes its own way, being merely the continuation of a single high-pitched note, broken by occasional trills, grace notes, and accidental quavers. Simultaneously, and with every step and beat of the drum, the dancers blow their whistles. For several minutes this continues; then, sharply, comes silence. Suddenly ponderous drumbeats break out once more, 10 this time; and now a fleeting return of the dancing melody—finally, only the women's voices continue to trill the last long-drawn-out note. Soon it starts all over again.

The dancing takes some time to get under way. At first, many sit, smoking. Some stand in their places, shrugging their shoulders, holding their forearms horizontally, their wrists limp; flexing their knees, lifting their heels slightly, whistling at every movement. After a while, one clears a path to the center pole with his feet, and soon begins dancing to it and back again. He may run or hop forward, then hop away backward; or use some slightly differing style. Others follow suit. Some dance in pairs, moving backward and forward, elbow to elbow.

During the course of the evening, stragglers join the dance. About midnight, a fire is lit in a ceremonial manner, just east of the center pole. An old-time warrior brings in an armful of wood. As he stands at the entrance, the singers start a slow beat of the drum. Then the warrior sings a special prayer song, a blessing, to the Great Spirit, from whom it is a gift. It has no words, but only a distinctive tune. When he has ended, he puts down the wood and lights the fire. He may use matches. Fresh wood is secured by the same or a different warrior: a number of them get several armfuls of wood apiece, just before bedtime. Each time they bring in the wood, they sing the prayer song. Having done this, they leave. Afterward, anybody may put a stick of wood on the fire.

For the next few hours, the dancing is perfunctory, most of the dancers resting and sleeping. Shortly before dawn, however, all resume dancing actively. Then the police clear the entranceway, while the dancers line up in a column of fours. As the sun is about to rise, the singers start a special song softly and slowly, while the dancers blow gentle blasts upon their whistles. When the sun rises, the singing becomes more vigorous, the whistling loud, and even more prolonged. Several dancers greet the sun by extending either the right arm or both arms level with the shoulder.

The dancers then come forward and, wrapped in their blankets, sit around the fire. The leader and a few others then sing a special song, muffling their voices by placing one hand close to the mouth. The last notes of the song are followed by a blast from the dancers' whistles which lasts as long as their breath holds out. Three more songs are similarly sung.

The leader now rises, strips off his blanket, and goes in front of the center pole, where he stands praying. TW gives a sample text:

hą: mekʷ nëma′p:ë në′waga’ pu′ixwɛnĭš [50]
Yes / all right / My Father / me-toward / looking-immediately /

në′më [51] ëšu′nthait ik‘ wĭ‘
us / you-blessing-are // Here is / now /

nëmi ëšu′nthaip mekʷ nĭm’ i′waix
that with which you bless us // All right / People / out here /

sɔgɔβaix ʒa:ŋkʷ hi′yimukʷ yĭ′nkhain us
out on Earth / well / progress! / forever // That is /

sunt nëmi ëšu′nthaip nu:nʒa wĭ‘
that way / that with which you bless us // Maybe indeed / now /

ha′gait në′:cigʷa ma′gup ha′nixɛnt ʒana′hanu
who(m)soever / ill / here inside / is-remaining / (you) well-make-may /

wĭ suni′hac nuhi′n te:′nam wai′p:a dĭre:′përë
now // furthermore / whatever / men-of / women-of / children-of /

cu′cugu’ë hi′hiβiǯɔ ʒa:ŋkʷ ɔyɔt‘ ʒa:ŋkʷ nayĭg‘ʷĭ
old men-(of) / old women-(of) / good / all / good / become !

ë′gëtiǯa dë′’ɔyip ke′’ĭmp i′yunkumankʷ
from now on-exactly / sickness / not-thence / thus bothered /

ma′sɔrain šu′waix mekʷ nëma′p:e dëąs
living // that way / all right / My-Father / and /

nëmba:′βi në′mi ešu′ndhait šu′we’ĭmp
My-Elder Brother / us / you-blessing-are // Thenceforth /

mak′hait këa′nuhwac nĭm’ dë′’ɔyβit
here-from / departed-having / people / sickness /

nasuwa′ʒina us wĭ‘ su:′βegaš
forget // That is / now / ended

Freely translated: "Yes, all right, My Father, as you look toward me immediately, you are blessing us. Here is now that with which you bless us: 'All right, People out here, out on Earth, progress well forever!' That is the way we are blessed by you. Maybe indeed, whomsoever remains ill inside here you will make well now. Furthermore, may whatever men, women, children, old men, old women there may be become well, from now on exactly, not bothered thus by sickness! That way, all right, My Father and My Elder Brother, you are blessing us: 'Thenceforth, having departed from here, let people forget sickness!' It is ended."

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[50] Literally, "being in a condition of looking immediately," from pui (to look),—xwan (immediate future), and -iš (participial suffix).

[51] It should be noted that the Peyotist Sun Dance leaders Tom Wesaw and Ben Perry deviate from normal Shoshone practice by using in their prayers the exclusive pronouns nëmë (we or ours, only) rather than inclusive damë (you and we, or your and our).

Dick Washakie, a nonparticipant, has formulated another concept of the prayer, which, although somewhat parallel in style to the one above, differs in content, being more self-centered. Thus:

cu:ʹmek^{w} ïʹgači nëʹšundheŋgën ëna^{i}ʹnišundheŋgën
Verily / now / I-(am)-blessing-causing / to you-praying /

nëmiʹagwaʼ naʹnïč ë:ʹʹ$^{in\epsilon}$ miʹagwai
as I keep going / (you be) a helper / protractedly / going-indefinitely //

meyiʹgwït šukani ëna^{i}ʹnišundheŋgën dëʹas
To him (I am) a sayer // That is it / to you-praying / also

nanarëre:ʹpɛrëʒi canʼ miʹagwaʼ meyiʹgwït
parents and children-little / well / going-indefinitely // To him (I am) a sayer //

nëšuʹβegant ëna^{i}ʹnišundheŋgën cu:ʹmek^{w} nëmaʹp:ë
To me-enough // To you-praying / verily / My Father

nënaʹŋgašundha uš mbeš šuʹbegant
me-hear-blessing-may (you be) // That is / already / enough //

naʹruʼɛŋgëma:n
Relating-finished-have /

In other words, "Verily now, I am supplicating, praying to you, as I keep living, that you help me live long. To Him I am a sayer of this: 'That is it, I pray to you also: that parents and little children will keep going well!' To Him I am a sayer of this: 'That is enough for me. I pray to you, verily, My Father, may you pity me! That is the end, enough.' I have finished relating."

The prayer finished, the dancers go back to their old places and strip off their clothes under cover of their blankets, which they wrap around themselves. Then they walk around idly outside the lodge. Some attend to nature, others chat, still others take a nap. At the same time the spectators and the singers leave for breakfast, the latter first placing the drum in the heat of the sun in order to tighten it.

The ashes of the fire are removed from the lodge after the morning ceremony, and fresh earth is put in to keep the ashes from burning the spectators' feet. (In 1937, the ashes were piled around the foot of the center pole.)

After all is ready, the singers come in, and the dance starts. The singers change for meals, but there is music continually until an hour before sundown. At this time all rest until nightfall. The dancers then may go outside a little way and lie around, but may not drink.

Thus the day continues. The dancers, now beginning to feel a little tired, alternate periods of rest and activity. From now on, anyone of them might suddenly faint. If this happens, he is covered by a blanket where he falls—he might be gaining supernatural power. If a vision is incipient, especially when the dancer is very thirsty, the buffalo on the center pole begins to look real. "He's going to fight you" (TW).

Further details vary according to individual experience. The most common features are hallucinations of drinking water, and then of seeing, often in a symbolic way, dead people in the mountains. Opinions also vary as to the source of the power gained. Some (EA, PP, TC) give credit to the ministrations of the Sun Dance leader. But Tom Compton has furthermore his belief in a "Spirit of the Sun Dance." Others, like TW, give the credit to God, while QQ attributes visions to the power of suffering and prayer in themselves.

After the dancer has recovered consciousness, he gets up. He feels well, neither hungry nor thirsty (DW, TC).

In the afternoon, curing of the ill often takes place. Several sick people may stand on the edge of the sacred dancing ground, facing the west, while the Sun Dance leader brushes away the illness from them with an eagle feather. Or both the leader and his assistant may stand facing the center pole, while their ill friend stands facing them. The leader then raises his right arm to shoulder level and prays. Tom Wesaw's version, given for the benefit of Leslie Isis, follows:

mek	nëma′p:ë	nï′wagant	ba:′na	pu′igwïnïš
all right /	My-Father /	me-toward /	above-from /	looking-immediately /

ïm	në	na′niʒawai	në	naŋgašundheŋᵏ	ik
you-by /	I /	help-draw down //	I /	hear-blessing-cause //	Here is

wï‘	te′:nap:ë	në:′cig‘wa	ʒa:′mana′hanu
now /	man /	sick /	well-him-make-(you)-may //

në	ëna′ŋgašundhak	ënëndë′as	nëmaba′:βi	ǯi′zas
my	supplication to you /	you-also /	Our Elder Brother /	Jesus /

ma′gʷiǯɔnai	nïʷ	ëšu′ndhait	pënt
him-save-willi ndefinitely! //	Person	(whom)-you blessing /	for whom

ëšu′ndhaik	dïβiʒi	mekʷ	nï	na′ŋgašundhain
your blessing (is) /	great //	All right /	I /	hear-blessing-am //

uš	suβe
That is /	all /

Freely, "All right, My Father, as you look immediately down at me from above, I draw a benediction through you. I supplicate. Here is a sick man, may you make him well! My supplication to you also, Our Elder Brother Jesus: save him! The person whom you bless, his blessing is great. All right, I supplicate. That is all."

After that, the leader brushes his illness away with an eagle feather. Although the leader repeats this act on the third day, on the second it is the assistant who prays for the ill man. In Ben Perry's words, paraphrasing his prayer for Leslie Isis:

hą:	mekʷ	nëma′p:ë	gɔ:d	pa:′na	në′wagant
Yes /	all right /	My-Father /	God /	from above /	me-toward

pu′ihwanïš	ik	wï‘	në′:cigʷa	ʒa:′mana’ac
begin to look /	here is /	now /	a sick one //	Well-him-having-made /

ʒa:ŋk	sik	sɔ′gɔwaix	ʒa:ŋk	mi′agwai
well /	this one /	Earth-out on /	well /	walking-will keep on //

ik	wī‘	nëx	në	hanǯ‘wap	nena′N‘īwp
Here are /	now /	we too /		I-friend-with /	my-like -relative-made /

ha′nīŋgeϕuindë′‵	wī‘	në′wagant	pu′ixwanīš	ik
make-cause-keep on-will be //	Now /	me-toward /	begin to look /	this

te′:napa	në:′cigwai	su:′ndë′ⁱ	wī‘	su′ni′′ac	dë′as
man (obj.) /	sick /	will bless! //	Now /	furthermore /	also /

mandī′rep	manawai′pa	manacu′gupa	dë′as	sundë
his children here /	his own woman here /	his own old man here /	also /	will bless! //

dëa′s	suniya′hac	ɔyɔgus	në:′cigʷa	pën	magu′phain
Also /	furthermore /	all /	(the) sick /	who /	here-inside-are

në	na′nišundhain	ʒa:na′nha	us	su′βegaš
I	pray /	well may become //	It is /	ended /

Or, "Yes, all right, My Father God, as you begin looking down toward me from above—here is now one sick. (You) having made him well, he will continue walking on this Earth. Here are we two, my dear friend and I, my future adopted relative.[52] Now, as you keep looking toward me, (you) will bless this sick man! Now, furthermore, you will bless his children, his own woman, his own old man who are here! Also, further, that all the sick who are in this place may become well, I am praying. It is ended."

The second evening and the second morning repeat the first exactly.

After the second sunrise rite, friends and relatives of the dancers build enclosures for them. Carrying saplings, branches, and cloths, they step on the dance floor without removing their shoes. They build a shed for each dancer by planting 7-foot-long saplings vertically several feet apart, about 6 feet away from the west wall. Cross bars a yard off the ground connect them with a railing of similar height previously built along the west wall. Against these bars are placed long, leafy branches. The front of the shed is screened by a hanging cloth, often spiritedly painted with mounted men and buffaloes. On the floor lie branches of willow and sagebrush on which some water has been sprinkled.

Various incidental activities take place on this day. Many dancers change paint, or substitute sagebrush branches for eagle hand-ornaments. Shamanizing occurs. Numbers of old men, seated by the rail on the south side of the lodge, take it upon themselves to harangue the dancers.

The thirst of the dancers, as well as their fatigue, is now very considerable, and occasionally they try to get relief through magical means. Thus, in 1929, Ʒari (Charley Nagoramie, I believe) got up in front of the center pole on the third day. He had an eagle feather in his hand. He turned toward the west and motioned, beckoning. A little later it started raining on the whole camp. The old fellow at the drum, Dɔ′šabɔηgoci (or Little White Horse), an old Sun Dance leader, took the feather from his hat band, and started making scattering motions with it. Right away the clouds broke up and floated away. Many saw this happen (MT, LS).[53]

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[52] This appears to be an isolated instance of ceremonial adoption in the Wind River Shoshone Sun Dance. Compare ceremonial adoption in the transfer of society privileges among the Arapaho (Kroeber, 1902–1904, p. 155) and Hidatsa (Lowie, 1913, p. 225 ff.).

The third evening and third morning repeat the routine of the first and second days. About noon, the dance ends. The leader and the other dancers are blessed by prominent visitors or local old men to whom they give presents. The manner in which they give these gifts I have not elucidated satisfactorily: it seems that some make previous, informal arrangements; others place shawls and other finery by the center pole, which the old people gather up, blessing the dancers in return. None of the gifts exceeds $5, for the Agency frowns upon larger ones.

When this time comes, the dancer steps forward, and the old man faces him, holding up his right arm, and prays, in Quitan Quay's words:

nu:′ma	ʒaηkʷ	mi′agwai	ë:′ⁱⁿᵉ	ʒaηkʷ
May-he here /	well (be) /	going-indefinitely /	protractedly /	well /

mi′agwai	dïkapa	ʒa:ηkʷ	dï′kamiagwai
going indefinitely /	food (obj.) /	good /	eating-going-indefinitely /

pa:′ⁱ	yi′wikai	us	ma	ʒaηk′
water (obj.) /	drinking-indefinitely //	That is /	he here /	good /

në′wikandë′	ë′ⁱⁿᵉ	miagaʷaϕuindë′	ʒa:ηkʷ
feeling-will /	protractedly /	going-indefinitely-keep on will /	well /

na′nišundheηgɛn	si′βa	sɔ′gɔβa	ʒaηkʷ
(I am) praying //	This on /	Earth (obj.) /	well /

manë′widuiϕuindɔⁱ	na′nišundheηgɛn	us	suwaix
his-feeling-will-keep on-will /	(I) am praying /	That is /	all

Freely, this says: "May this one here go well, protractedly go well, eating food go well, drinking go well! That he here will protractedly be feeling well, indefinitely keep on going well, I pray. That on this Earth he will keep on feeling well, I pray. That is all."

After this, water is brought to each end of the line of dancers by old men who have no special title but who have lived a long time, so that the dancers, too, might live long. The Sun Dance chief or some prominent spectator offers a prayer for the water, a bucket of which is now passed from both ends at once, so that each may drink twice. Only the dancers may drink, and they do so in order to wash away illness, to get well in drinking. They rinse their mouths, but only vomit occasionally, for the water today is pure, without clay (TW). When finished, they change into ordinary clothes, pack up and leave. Outsiders may come in now.

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[53] Compare Akwa'ala rain-chasing. Cf. Gifford (1928, pp. 347-348).

The dancers rest, bathe, and drink during the afternoon following the dance, then go to the public feast in the evening, which is generally on a beef. Social dances, such as the *narayar*, or Ghost Dance, and the *waip:ĕnĕkar*, or Women's Dance, may follow.[54]

For days afterward, sickly people bring in their old clothes and tie them to the center pole, so that they may be relieved like the dancers. Formerly, the Sun Dance lodge was left alone until it rotted and fell. Now, nothing is touched for a month or two, except possibly by children, after which the Sun Dance committee sells all the wood in the lodge other than the center pole. The proceeds go into the treasury for the next year's Sun Dance.

THE MODERN SUN DANCE—1937 VERSION

In 1937, a middle-aged shaman named Tom Compton let it become known on Decoration Day that he had received supernatural orders to give the Sun Dance.[55] (See pl. 30, upper.) Lynn St. Clair became the head of the Committee, while Lehi Aoah, Gilbert Day, and Logan Brown were members. A little later, it was decided to hold the Dance from the 3d to the 6th of July. So, toward the end of June, Compton and his family moved out of their log cabin into a tent which they set up on the Sun Dance field.

On the morning of July 1, Compton walked out of his tent, and was joined by an old man mounted on a horse, who held a digging-stick in his hand. The two of them came some 130 yards away from the tent. Then the old man dismounted, and aligned himself just due east of the entrance of Compton's tent. At the place so located he dug a shallow hole with his stick, and placed in it a small pile of rocks. Compton stood by, merely watching. The old man, having finished, remounted his horse, and left. Compton departed also. (See pl. 30, lower.)

Toward the evening of the 1st a few tents—here and there a tipi—were pitched as visitors began arriving. More kept coming all day the 2d and on the morning of the 3d, reaching a total of 50 or more by that time.

On the 2d, the desired trees (cottonwoods forked at the top, for the vertical posts, and pines, for the rafters) were selected, chopped down, trimmed, and hauled prosaically in Indian Service trucks to a single spot some 600 yards south of the Sun Dance field. But the Indians did not move this lumber to its ultimate place of use until the morning of the 3d.

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[54] For descriptions of Shoshone dances see Lowie (1915 b), especially pp. 821–822.

[55] Decoration Day has long been an important event among the Wind River Shoshone. In preparation for it many families make artificial flowers of paper to adorn the graves of the soldiers and their own deceased in Fort Washakie Cemetery.

I came on the scene at 10:30 a. m., when events were already under way (fig. 21). Six or eight old men, mounted, with few exceptions unarmed, dressed as usual but for a few strangely clean and gaudy shirts, guarded the lumber and several pairs of wagon wheels nearby. Other horsemen were everywhere. Far away, up on the hills to the south, young men galloped furiously hither and yon. On the plain to the north was a large body of riders, among whom I could recognize Tom

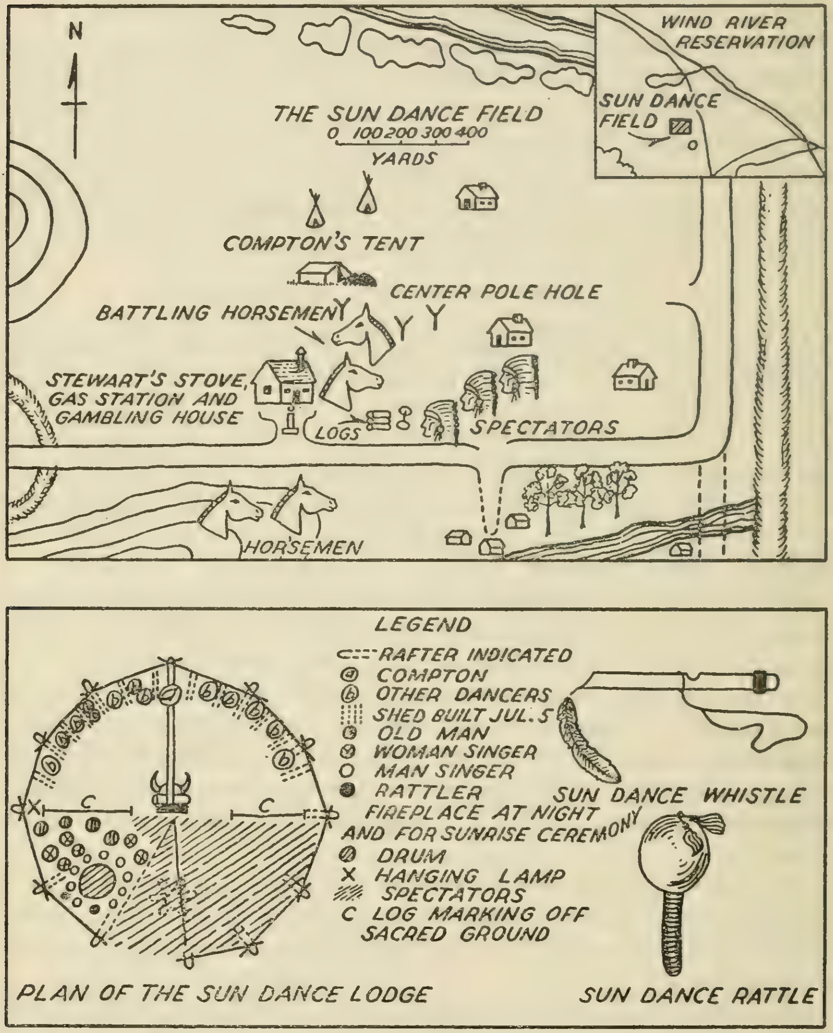
N
THE SUN DANCE FIELD
0 100 200 300 400
YARDS
WIND RIVER RESERVATION
SUN DANCE FIELD
COMPTON'S TENT
CENTER POLE HOLE
BATTLING HORSEMEN
STEWART'S STOVE, GAS STATION AND GAMBLING HOUSE
LOGS
SPECTATORS
HORSEMEN
LEGEND
RAFTER INDICATED
a COMPTON
b OTHER DANCERS
SHED BUILT JUL. 5
OLD MAN
WOMAN SINGER
O MAN SINGER
● RATTLER
FIREPLACE AT NIGHT AND FOR SUNRISE CEREMONY
DRUM
X HANGING LAMP
SPECTATORS
C LOG MARKING OFF SACRED GROUND
C
C
SUN DANCE WHISTLE
PLAN OF THE SUN DANCE LODGE
SUN DANCE RATTLE

Figure 21.—Sun Dance layout and paraphernalia.

Compton. On his head was a red kerchief; on his face were vertical streaks of white paint, and dark glasses; around his waist was a fancy beaded belt. Close by him was Quitan Quay, conspicuous in a fringed buckskin costume.

To one side two middle-aged women dressed in blue-and-red imitation elk-tooth dresses, were quietly sitting on horses gaily decked out in beads, using old-style saddles with very high pommels and cantles. The women's faces I could not see, but in their hands they held willow branches. Also bearing willow branches were the five boys beside them, who were, however, plainly dressed.

Suddenly, Compton's group began to gallop toward the pile of lumber. I could not see what happened in the confusion of the moment at which they reached it, but, soon after, Quitan Quay left the group and started to ride back and around. He was shouting, apparently, that Compton had shot the center pole.

Then all dismounted and joined together in the jobs of putting the logs on wagon wheels and harnessing the horses to haul them to the Sun Dance field. Once the group had arrived there, the timber was unloaded close to the spot at which the old man had dug a hole on the 1st of July. After this, all rested for a while, except for Quay, who rode around again, urging everyone to hurry over for the prayer that was to follow. Compton was sitting on the future center pole, nonchalantly smoking a cigarette.

In a few minutes, about 11:15 a. m., when a fairly large crowd had gathered, Compton got up, faced to the east with head bowed, and started to pray in a scarcely audible, monotonous voice. The heads of the others who were lined up on both sides of the future center pole were also bowed, and their attitude seemed serious. Farther away, however, the behavior of the spectators was scarcely affected. Some kept on walking, others talking; Logan Brown, for example, was laughing most of the time.

When the prayer had ended, Quitan Quay announced that all the activities were over for the time being, and would be resumed when the sun would be—he pointed—at its position of 3 or 4 o'clock. So, with most of the others, I then left.

But a few men stayed on, and started work under Compton's direction. They measured the radius of the planned lodge with a rope, located the holes for the 12 outer posts, dug the holes with steel crowbars and shovels, put in the posts, and tamped the earth around them. (See pl. 31, upper.) By 2 p. m., when I returned, one or two of the posts were up.

In an hour, the men had finished erecting the side posts, and begun measuring and notching the rafters, the tips of which they placed in the forks of their proper posts with the help of paired poles tied together with rope. Only the "backbone," or east-running rafter, was left on the ground.

At the same time, Compton was preparing the center pole. He tied the willow bundle underneath the center pole, just at the fork. Then someone brought in a good buffalo bull's head—a poor one had been rejected first—which Compton now stuffed with sagebrush and furnished with eyes of clay. Then he lashed it firmly to the pole and bundle. (See pl. 31, lower.)

Meanwhile, Moses Tassitsie, who seemed to be supervising the work, painted two bands of black around the center pole. (See pl. 31, lower.) They were each about a foot wide, and a foot apart. The lower edge of the bottom band was some five feet from the butt of the pole. The pigment was charcoal, which Tom Compton took from the fireplace of his own tent in a metal pan, mixed with water, and ground. At last, after the painting had been completed, Compton tied a white rag around the fork to the right of the buffalo head, a blue one on the fork to the left.

About 4 p. m., when all this had been done, a different herald shouted an announcement to get all the available men together. About 20 of them then lined up on either side of the center pole. Eight others, among them Compton and myself, were farther back, holding the sets of lifting poles, one short and one long set on each side of the center pole.

When all were alined, seven or eight of the men just by the pole started singing in a low voice. The men with the lifting poles kept time by hitting their poles together. When the song had been ended, Compton said, "me:kʷ!" (ready!), and they lifted the center pole waist-high off the ground, then let it down again. This was repeated twice more. The fourth time, they sang much more loudly. Then they placed the center pole in its hole and, with much effort (the lifting poles coming into play toward the end) raised it upright. Now they rotated it until the buffalo head faced exactly west; then they filled the hole with dirt and tamped it down. Following this, the rafters were put into place according to the regular routine mentioned previously. (See pl. 32.)

Among the spectators I saw Dick Washakie sitting on his horse, interested but inactive.

It was now 6:50 p. m., and I left, being gone until 7:30. At that time the last of the large tree branches that formed the wall of the lodge were being placed against the rafters: the lodge was complete. Compton, still in his ordinary dress, was shouldering a shovel, hurrying from his final work. (See pl. 33.)

As darkness fell, activity gradually increased about the Sun Dance field. Here and there could be heard the testing of drums and occasionally the single shrill note of a Sun Dance whistle. Several times a herald yelled for the dancers to get ready to assemble. About Compton's tent were many people and much activity, and from it, at about 9 p. m., six men and youths wrapped in blankets stepped out. Naked but for their scanty Sun Dancers' garb, blowing their whistles in long-drawn-out blasts, they shuffled forward gingerly. They went straight to the west wall of the lodge, then to the north, circling it completely once, and in.

What happened then, I could not see, because of the press of the crowd, but I caught a glimpse of Compton coming up to the center pole, and heard him praying. Then the singing started.

The orchestra began singing softly, led by Logan Brown—not the rattler—who was accompanied by four or five of the others, as well as the gentle beating of the drum, about 130 beats to the minute. The melody, sung in a high-pitched, strongly nasalized voice, was complicated by individual trills and even whoops, but seemed to revolve around the meaningless syllables: "ya . . . he", which rose in pitch, and then dropped to a long lower note, to be followed by a variant, "ya: . . . a . . . he'", with the "ya" now being trilled and lengthened.[56]

For 12 or 16 beats of the drum this continued. Then came a pause, and 5 slow, ponderous beats.

Now a full dancing rhythm was taken up. All joined in a pleasing blend of men's and women's voices, short, shrill blasts of Sun Dance whistles, and simultaneous beats of the drum—now about 160 a minute. The melody was a little different, insofar as I could grasp it out of its complicated choral arrangement. It started with a descending "he: . . . ha",[57] and continued the final "a," rippled by several trills, for a number of beats; and then did the same for "he: e: ha."[58] For several minutes this continued. A sudden silence, 10 solemn drumbeats, a momentary return of the dancing melody, and the continued trilled note of the women's song marked the finale.

The dancing started slowly. At first, most of the dancers merely stood in their places and blew their whistles. One also shrugged his shoulders, flexed his knees slightly and lifted his heels a little off the ground. Others yet sat, smoking and chatting. After half an hour of this, Compton came forward from his place due west of the center pole. He shuffled his feet carefully, picking up stray rocks and weeds, which he threw toward the center pole. When he arrived within 4 or 5 feet of it, he turned his back and walked casually to his place. His example was soon followed. A little later, Compton danced forward within 4 or 5 feet of the center pole, using a short running shuffle that barely took his feet off the ground; shaking his torso with every step, elbows bent, forearms horizontal, and wrists limp, he blew his whistle loudly with every step. Then he retreated to his place by a series of rhythmical, short hops with his feet together. Others followed suit, although some shuffled their feet going backward as well as forward. Some good friends danced in pairs, elbow to elbow. Never did anyone turn his eyes away from the center pole. But the number dancing thus was never great at any one time. Most kept dancing in place, or continued to sit and smoke.

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[56] Low pitch on the first syllable; low, rising pitch on the second.

[57] High, falling pitch on the first syllable; low pitch on the second.

[58] High, falling pitch on the first two syllables; low pitch on the last.

While this was going on, the spectators milled around in the space open to them, and children played even on the border of the dance ground without being chased away. Several times men came into the sacred area without removing their shoes. They were bringing blankets for the Sun Dancers.

During the course of the night a number of latecomers joined the dance, straggling in singly, so that by the next morning there were 38 in all. This number included 4 Idaho Shoshone; 2 Bannock; 1 Shoshone from Washakie, Utah; 1 Ute; 3 Wyoming Arapaho; and 1 Arapaho from Oklahoma. The local contingent was almost as heterogeneous, ranging in age, for example, from Sequiel Hurtado, Jr., who was 19, to Louis Enos in his late 70's. I left about 11 p. m.

I returned at 3:50 a. m. There was now a fire just east of the center pole, around which most of the spectators were huddled. The singers were a different group from that of the evening before. They were doing rather poorly. They were obviously tired, their timing was off, and their notes went sour quite often. Most of the dancers were sitting or lying down, wrapped tightly in their blankets against the cold. A few danced desultorily. The picture of apathy was completed by a pair of Indian cowboys, much the worse for liquor, who staggered in across the dance floor to give one dancer a package of cigarettes. (See pl. 34, *upper*.)

As it became lighter, however, the singing became stronger, and more and more dancers joined in, dancing energetically, for it was rather chilly. Then a couple of middle-aged men quite unceremoniously cleared all the spectators out of the entranceway. At 4:40 a. m., the dancers lined up just west of the center pole, their blankets at their feet, four abreast in the first line, an irregular number in the ones behind it. The sun was just about to rise. The singers now started to sing softly and slowly a special song, while the dancers blew continued gentle blasts upon their whistles.

The sun rose, and the singing became more vigorous, the whistling loud, and even more prolonged. Several dancers greeted the sun by raising either the right or both arms to shoulder level. (See pls. 34, *lower*; pl. 35.)

When the song had ended, the dancers filed forward and seated themselves, huddled in their blankets, in a circle around the fire. (See pl. 36, *upper*.) Compton was next to the center pole, and facing east. Softly, his voice muffled by a hand held partly over his mouth, Compton began to sing, joined only by a few of the other dancers. The rest merely bowed their heads. The last notes of the song were followed by a blast from their whistles that lasted as long as did the dancers' breath.

Three more songs were similarly sung.

Then Compton got up, stripped off his blanket, and stood by the center pole, facing the rising sun. His appearance was ghastly, his exhaustion emphasized by the white paint around his eyes. His head was bowed a little, one hand rubbed against the other from time to time; he swayed erratically from side to side. All were quiet—even the drunken cowboys; nearly all bowed their heads. In a low, barely audible voice, Compton started to pray, almost to chant. I could catch words: ". . . good life—indefinitely . . . much food . . . may be . . . I pray."

(ʒa:ŋk' mi'agwai . . . so:dị̈'kapa . . . na'nha . . . nĕšu'ndheŋgĕn . . .)

These 5 minutes of prayer marked the emotional climax of the Sun Dance.

At the conclusion of the prayer, the dancers went back to their old places where, under cover of their blankets, they stripped off their regalia, leaving one blanket tied around the waist. Then they went in to sleep a little, and I left, at 5:55 a. m.

I noticed no changes in the procedure of the dance until my visit at 9:45 a. m. on July 5. About 25 poles some 7 feet high had been planted in the ground, about 6 feet away from the farther wall, to which they were connected by cross bars raised 3 feet off the ground, and spaced 3 or 4 feet apart. On the cross bars were leaned branches; cloth screens hung down between the vertical poles. The sheds so formed were lined with branches and with sage. (See pl. 37.)

The dancers were painted differently now, some having their bodies covered entirely with yellow. Most of them danced in pairs. Instead of eagle down-feathers, one had a long frond of sage in his hand.

When I returned at 3:30 in the afternoon, only one or two were dancing, the others lying in their sheds. Then a number of women and one girl alined themselves directly south of the center pole, all facing the west. Compton, with an eagle wing in his right hand, now danced up from his stall to the center pole. From there he walked behind the nearest of the women, and brushed down her back from shoulder to foot with his eagle wing. He did this to the others also.

An hour later, during a lull in the singing, one of the old men seated by the south barrier to the dance floor fanning themselves with eagle feathers, started to harangue the dancers in what I later learned was Arapaho.

On the 6th it started to rain heavily, and as an unfortunate result the end of the dance came earlier than expected. So, when I arrived at noon, all was over. The dancers were in their stalls, changing to ordinary dress, and emptying rapidly the several cases of Coca Cola which were on the dance floor. Among those who brought in their clothes I saw Marshall Washakie.

By the center pole was a large pile of clothes, most of which were soon taken away by old men and women. I saw one dancer pay an old man a dollar, presumably for a blessing he had received.

Soon the dancers were walking out of the lodge and about, looking lean but far from exhausted, and seeming rather proud of themselves.

That evening, I learned later, there was a feast, among the ingredients of which were coffee and cookies. I did not attend because of the heavy rain. Incidentally, I also learned that a number of Bannock had put on a Ghost Dance for an hour or so one night of the Sun Dance.

Toward the end of July, I happened one morning to look into the Sun Dance lodge. Inside, a number of youths were practicing the whistling and dancing of Sun Dancers. On the center pole, about 4 feet off the ground, were tied very many old clothes. Otherwise, the lodge was untouched.

The leader of the Sun Dance in 1937, Tom Compton, is an interesting person. He is a half-blood and was about 50 at that time. Two half-brothers and a maternal uncle on his mother's side were shamans; the background of his white, paternal lineage is not known to me.

Compton was born at Lemhi, Idaho, and came to Wind River only in 1923. He was accompanied by several relatives, among them his brother James, now (i. e., 1937) an Agency policeman. For the last 12 years Compton has been practicing shamanism actively. Economically he has not been extremely successful, and has had to eke out a living with WPA work.

Although his house is poorer than the average, his wife is energetic in maintaining the household. His children are bright and leaders at school. No serious family trouble has occurred in his home.

Compton's education is clearly better than average, yet he is close enough to the old habits to abandon his house for a tent at the death of his mother. He is not antagonistic toward the hospital and physician, and has been interested in the new trachoma treatments, and willing to take advantage of them. But he holds his own Medicine as something apart, incommensurable.

White opinion of him is not high: he is reputed to be an alcoholic. Indian opinion varies. Thus Millie Guina, a young Sage Creek woman quite representative of people of her age, is sympathetic to him and believes he is trying to help them all. But one of the main figures in the Peyote cult told me that Compton was shiftless, neither liked nor respected by the other Indians. A half-blood, influential as a one-time leader of the Wolf Dance and Indian judge, was very uncomplimentary to Compton. He stated that the latter had had neither visions nor supernatural power, and was really giving a pseudo-Sun Dance that would help no one. "He was doing it just for the money he might get out of it."

I was strongly impressed by Compton the first time I met him. Without persuasion on my part, he started to talk of his Sun Dance experiences and visions. He talked rapidly and continuously in a soft monotonous voice. His manner was deadly serious, his facial muscles were tense, and his eyes shone noticeably. When he talked, nothing seemed more obvious, understandable, and true than his visionary experiences. He seemed permeated with great love and pity for the world, a desire to relieve its suffering.

Contrasting strongly with this was the sight of his dog, tied up, allegedly for egg sucking, and nearly dead from starvation. He taunted it with food. I tossed it a few scraps, and it cringed violently when I did so. (It is noteworthy that many Shoshone, particularly Tassitsie, show remarkable gentleness with animals.) Compton's ill mother, her eyes suppurating from trachoma, did not appear well cared for either.

Compton took peculiar pride in her. "You wouldn't be doing very well if you were as old as she. She's 114!" To my eyes she didn't appear older than 75.

I saw him again on July 1, when he had already moved out on the Sun Dance field. There was a marked change: house, children, even —to some degree—his mother, were spick and span. His dog was no longer tethered and looked merely very emaciated. He asked me to photograph his children in Indian dress. He was relaxed, pleasant, and smiling when he led me over to see the digging of the hole for the center pole. (However, I learned that he had just been released from jail for driving an automobile while drunk.)

Following the first morning ceremony, a few minutes after his dramatic prayer, I talked to him again. I noticed no emotional tension in him. He was jocularly commenting to me that, while the Sun Dancers were as yet chatting and walking around very spryly this morning, it would be very different two mornings later.

I saw him another time just after the Sun Dance, while he was guzzling Coca Cola. He seemed relieved and rather proud of his physical ability. "We have just passed through a great desert." He was glad that the rain had come. And, despite the fact that no one had fainted or had had visions, he seemed satisfied and thought the Sun Dance had been very successful.

His own account of his visions and supernatural experiences gives particularly good insight both into the norms of such affairs and his deviations therefrom. Almost verbatim, it is as follows:

> The first Sun Dance I attended was at Fort Hall in 1908. I knew nothing about it then. I had just returned from school, where I had got hurt playing football. The doctors pronounced it heart disease; they did not expect me to live. I was sent home, very sick. The old-timers told me to try the Sun Dance . . . I was going to die anyway.
>
> It lasted 4 days; by the second, I felt very bad; better the third, and by the night of the third day, normal.
>
> After that I took notice of the dance, and went into three others, nearly every year. My heart never bothered me. I saw several other cures.
>
> On the fifth time, I fainted. I didn't feel weak—something just batted me on the head. I did not know whether or not I had fainted.
>
> Some kind of a human—it floated about a foot and a half above the earth—drew my attention. It floated like a fog. Then I tried to run it out of the dance hall. Then it made a dive at me, hitting me with its shoulder and head. It knocked me head over heels, and went on beyond, leaving me lying there.
>
> After I hit the ground I knew nothing for an hour or an hour and a half. They carried me to my stall.
>
> Then I noticed I was not in the dance hall. I found myself on a high mountain, one half of it white lava [sic]. It was a ridge running to the west. The lower half was green with grass, sprinkled with flowers. Looking the country over, I saw it was strange to me, country that I had never seen before.
>
> Even with me was a little stream, with tall weeds growing by it. It was a running stream, with clear water. I knelt down to drink. I was going to drink. But, just as my mouth was nearing the water, something—inside of me?—said, "Wait." Again I bent down, and again it happened. The third time, just as my mouth touched the water, I looked up.
>
> It had been the Buffalo that spoke, the Buffalo of the center pole. It kind of circled around me. Then it turned into a human being. I looked at it, wondering. Why was it staring at me? I knew then that it was the same man who had knocked me over.
>
> He took three or four steps toward me, then he stopped. He seemed afraid of me. He said to me, "The first drink you take: don't hold it down. If you do, it will kill you. The next time the water will be purer. The first drink will be poisoned in your body. If you drink it, you won't live long.
>
> "The second time it will bring up diseases and blood. The third time it will be pure water, with just a little blood in it. The fourth time, drink all the water you want. That is why I stopped you." He circled around me again, and left.
>
> I put my hands into the water—that far [Compton gestured to points halfway up to his elbows]. And I drank and drank. I was bloated worse than a toad when I got through finally.
>
> It was well along in the afternoon then, 3 o'clock or so. I sat down and looked around. Way out to the north-east, in a sort of desert, I saw a Sun Dance hall. It was 2 or 3 miles away, out on the flats.

It seemed as though I had been on a long journey from the west. It seemed as though I had been dry and thirsty, tired. I rested for an hour by the spring.

When I got up, I was perfectly satisfied. And I got up. I noticed I took two or three steps. Then I knew nothing of the other steps until I was 15 or 20 feet away from the hall—I just seemed to float.

Now I walked around the south side of the hall, to the door facing the east. I could see the people looking through the bushes of the walls, watching the dance. They did not see me. They were jammed together. I squeezed through and slipped to the front.

I looked around and, in the north of the hall, I saw a vacant place. There was a nice shade there, where a body was lying, asleep. I made up my mind to go there and rest, and watch the dancers. I started, and walked right across the hall. I sat down right at the body's feet. I looked at the dancers. Pretty soon, I began to lie down. It seemed as though I had begun to wake up.

I didn't know whether I had slept or not. Now I heard the drum and the singers, heard the old men urging the dancers on. I was puzzled. How had I first come in? I tried to figure out how it was: it seemed so true that I had gotten this drink. Right there I tried to figure it out.

I finally thought: "I had started to run him out. He hit me." I traced myself from there to the mountain, drinking. But I was as dry as before. I had seemed stuffed with water when I had left the spring. I seemed dry when I awoke. It seemed just like a dream.

I pushed the cover off my head. Then the Dance chief and another fellow came over—somebody had told him I had awakened. He asked me, "Have you awakened? Have you seen anything? Have you had your drink?"

"Yes," I said, "but I am as dry as I was before."

"What did this to you?"

"I don't know. It was some kind of a spirit that knocked me out."

"From now on you won't have to suffer," they said. They asked me if I had seen anything more. I told them of the Spirit's orders.

They said, "In time you may get so that you may know something of the Dance. Some day you may handle it yourself."

After the leader asked me, he seemed to be glad that I had been helped. At that time I didn't understand. It seemed that the leader was more pleased than I. He was Woodpecker (A'ʒaba), a medicine man.

I didn't realize the meaning of this. I didn't care. I was young. I believed in the Sun Dance because I had been cured by it of heart disease.

I just went on, got along the best I could until I married and started a family. Two or three years after the first vision the same spirit knocked me out again. It told me to go into another Sun Dance. Nothing happened that time, but I could see different things: spirits of the Sun Dance. Then I got a greater belief in the Sun Dance, began to study it over, took more notice of it. I got a good line-up on it and its meaning from the old-timers. I traced it back. It gave me more interest after I learned of Christ and His fast. I got some meaning from it. . .

Up to now I have been in 13 Sun Dances. This will be my fourteenth, and the third one I have run. The others were in 1929 and 1932.

I am not a medicine man or anything like that. But I began to have a strong belief in it. I began to think it over—and having this Spirit knock me over . . . It began to talk to me and to come to me at night. If any of my relatives was sick, the Spirit would come to me at night, tell me what to do, what kind of prayer to use for the sick person.

From then on I began to believe in the Spirit. I got success on several occasions.

Since then, I have helped many sick people. I am not a doctor, I just use words and prayer, the name of God, and the Spirit of the Sun Dance.

Since then, I have seen other spirits in the Sun Dance that came and gave orders, to which I paid no attention because my first Spirit was my main one. And it told me not to heed them. In the long run they would do more harm than good to me and those I tried to help.

This one Spirit told me that the others are descendants of the Devil. In the long run they would kill you. Evil spirits exist as well as good ones, and they tempt you to do wrong. The main Spirit has kept me from following the others.

Seeing spirits is not like a dream. They'll come to you—you can talk to them during the night. You'll be asleep but you'll never forget what was told to you. In dreaming, you forget next morning what you have dreamt. When a spirit comes to you, you don't forget nothing. And another thing in the spirit line: the spirit will direct you to the God above, and give you a certain way to call for help, to help the sick on earth. The spirit will tell you to do these things to help the sick.

You read in the paper of an Indian doctor hollering and dancing. My part is not like that. My power in order to help people is a spiritual power. What help I get is from God Almighty. Whenever I call on Our Father, I see that the person I am helping gets relief. Not by dancing, nor by any medicine, but just by a few words I relieve them of their sickness, help them. I have been doing this for 12 years. I have always been successful because I knew what to do before I went in.

If I did not help the first time, the Spirit comes to me the next night. It tells me whether or not I can help the sick person. If not, there's no use. Then it is his time to go; God has him already in his power. I'll go just so far. But if a more powerful spirit than mine has him, I would just not try.

I don't know if they'll call me an Indian doctor, or what. I'm different from the others. They will use songs. All I use are the four prayer songs of the Sun Dance. I still use them. I use no medicine, I just use this power, the Spirit of the Sun Dance. It directs me to the Great Spirit above; through that I can help people on earth.

When my Spirit first knocked me over, it was just a blur, though I saw a human form in the blur. After 2 or 3 years it became more clear; I could see it more. It began to give me ideas and ways to help the sick, and how to handle things in the spirit line. Then he came out clearly: he is a Spirit, not of God, but of the Sun Dance. Still, he may be in touch with the Great Spirit above. If not, I don't think I could help people. Other spirits—whenever you see them, you can tell them: they are altogether different. They'll come to you as an animal, an elk, a lion, a wolf, or a bear. They'll keep changing from one to the other, drawing your attention. That's not a helping spirit. The Devil is sending him to do wrong, harm the sick. I've always been glad I learned the main Spirit and got so I could protect myself from the others.

Today, I don't have to suffer in a Sun Dance. I can go for 7 days without eating or drinking. I have the Power behind me to do it. Green hands, the beginners, are the ones that need help. You've got to help them. They've got no Power of any kind; there's no spirit behind them.

A person with Power is there to help them. In order to help them you've got to call on the Spirit to relieve them. For 5 or 10 minutes after that the boys or men find relief; they then are as fresh as when they went in. But it won't last; it will wear off, for they'll go too fast and wear themselves out. They'll suffer as much as before. Usually you've got to help them two or three times before the dance is over. Otherwise, they'll suffer greatly.

In the old days they used to go through this suffering until they were knocked out. Nowadays, it's not that way unless a spirit comes and lays you out Nobody urges you to keep on going until you fall. The old men used to urge the young to keep on going until they saw things.

It's [the Sun Dance] the same as a church, only it's held once a year. It's put on in the same form as any church. The songs are just tunes, but they mean the same. They're from way back; they've never been changed. In the Sun Dance there is no worship of the Sun. It is through the Sun.

Compton's account is exceptionally detailed and vivid, particularly in regard to motor sensations. It is almost poetic in its imagery. Yet in a highly symbolic fashion, it clings rigidly to the tribal pattern. The ceremonial number four, the butting by a visionary power, the buffalo, its transformation into a person, and the sensation of drinking water are obviously stereotyped.[59] Even further, the scenery he describes approaches that of the land of the dead if we note with Brackett that . . . "When an old man is dying he finds himself near the top of a high hill on the Wind River Mountains [which is the locale of Compton's description], and, as the breath leaves his body, he reaches the top of it, and there, in front of him, the whole magnificent landscape of eternity is spread out, and the Sun-Father is there to receive him and to do everything in his power to make him happy" (Brackett, 1880, p. 330). This also clears up Compton's mysterious allusion to worship *through* the Sun, for we may note that "they believe in Tamapah (damë a′p:ë, Our [incl. pl.] Father, or Sun-Father, who is the Father of the Day and Father of us all, and lives in the sun" (Brackett, 1880, p. 330; Russel, 1921, p. 144).

Stylistically too, a few features are patterned in his account. An example is the directions given him by his Power. The initial negative, the final antithetical positive are typical of the tribal literature (Shimkin, 1947 c).

It is clear that Compton is an intelligent man, introspective and highly imaginative, who sensitively elaborates new permutations—like his "Spirit of the Sun Dance"—of a rigid pattern. I believe he is unquestionably sincere, moved by drives, fantasies, and traditions largely outside his control. But a certain amount of sophistication and an inherently good sense of humor inhibit exaggerated mysticism.

At the same time, his personality is not completely adjusted. Possibly his relation toward his white father and certainly his difficulties in being accepted in a strange community, in fighting the established interests of the Peyotists, have contributed to this. In any case, the transparently hysterical character of his early illnesses, the ambivalence of his dreams with their good and evil spirits, and his occasional drunkenness and cruelty are symptomatic of emotional strain. Nevertheless, Compton is one of the most gifted and sanest Wind River

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[59] Compare the Crow Indians (Lowie, 1922, p. 324 ff.); in the typical Dakota vision, on the contrary, a person turns into an animal. (Cf. Wissler, 1916, p. 81.)

Shoshone I know. He is not inhibited to the point of dead pragmatism. He does not alternate between jovial expansiveness and sharp suspicion. He is not a dreamer so preoccupied with his fantasies that all else is of little moment.

Thus the leader of the Sun Dance in 1937 had an outstanding personality, a type of personality the little-formalized, fluid character of Wind River society tends to place in positions of prominence.

SOCIAL AND PSYCHOLOGICAL FACTORS

In what ways have the changes in the culture of the Wind River Shoshone since the nomadic days of the midnineteenth century modified the attitudes influencing the Sun Dance or altered the social and psychological functions of the ceremony?

Shoshone attitudes appear largely to have remained constant. Egalitarianism is still strong. Individual restraint and psychological inhibition generally appear to have increased since the Shoshone have become more aware of their poverty and social isolation from their white neighbors.[60] On the other hand, schooling, the Episcopal and Catholic churches and the Peyote Cult seem to have reduced habits of extreme individualism, and to have increased receptivity toward a common religious dogma. It is noteworthy that many individualistic elements of old Shoshone culture, such as the vision quest, medicine bundle, personal tabus, and individual curing shamanism have vanished or been greatly weakened since the turn of the century, while elements involving group participation have survived more successfully. Thus, Wind River Shoshone world outlook, while basically unchanged, may have become less disinclined to formalism and stereotypy than before.

What is the relation between the Sun Dance and the social structure of the modern Wind River community? As in the old Sun Dance, formal ties are lacking, but actual informal correlations are significant. This problem is worth examination in detail, with reference to the dancers, leaders, Sun Dance committeemen, and old men and warriors, respectively.

The dancers represent nearly every male group in the community; their principal difference from nonparticipants appears to be psychological. Geographically, the distribution of the dancers is uniform, with only the marginal Burris and Ethete districts showing markedly low numbers of dancers (figs. 22 and 24). The degree of blood admixture is but a little toward the full-blooded side of the mean of the community profile, with a mean of 0.75 Indian blood, a range of 0.25 to 1.00. Economically, there is a corresponding picture. The mean

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[60] Based upon 185 Rohrschach tests and other psychological data (cf. Shimkin, 1947 a and n. d.).

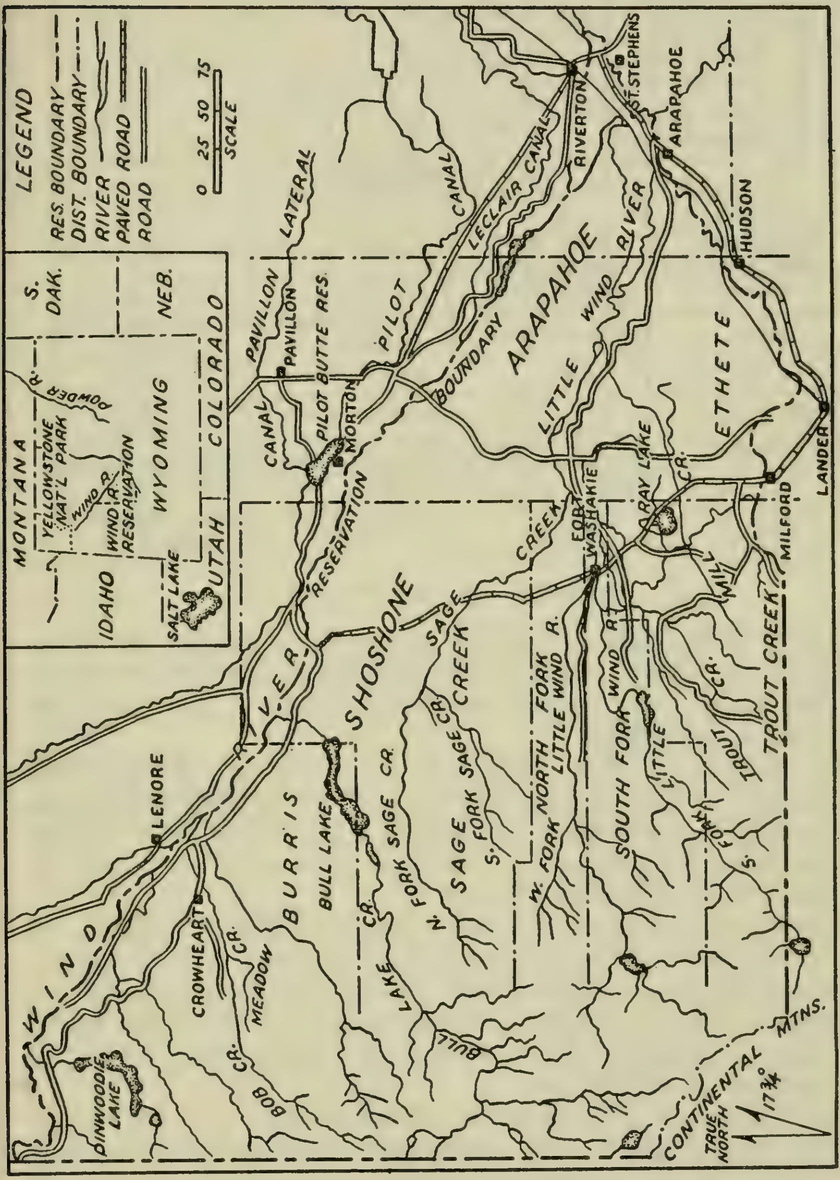

LEGEND
RES. BOUNDARY
DIST. BOUNDARY
RIVER
PAVED ROAD
ROAD
0 25 50 75
SCALE
MONTANA
S. DAK.
YELLOWSTONE NAT'L PARK
POWDER R.
WIND R.
WIND R. RESERVATION
WYOMING
NEB.
IDAHO
SALT LAKE
UTAH
COLORADO
PAVILLON
PAVILLON
LATERAL
CANAL
CANAL
PILOT BUTTE RES.
PILOT
MORTON
LECLAIR CANAL
RIVERTON
ST. STEPHENS
ARAPAHOE
HUDSON
BOUNDARY
ARAPAHOE
WIND RIVER
LITTLE WIND
ETHETE
RAY LAKE
CR.
FORT WASHAKIE
LANDER
MILFORD
MILL CR.
TROUT CREEK
TROUT CR.
RESERVATION
SHOSHONE
SAGE CREEK
SAGE CR.
CREEK
N. FORK SAGE CR.
S. FORK SAGE CR.
SAGE
NORTH FORK LITTLE WIND R.
W. FORK
SOUTH FORK WIND R.
LITTLE WIND
S. FORK
WIND RIVER
LENORE
BURRIS
BULL LAKE
BULL LAKE CR.
BULL
CROWHEART
MEADOW CR.
BOB CR.
DINWOODIE LAKE
CONTINENTAL MTNS.
TRUE NORTH
17¾°

FIGURE 22.—Wind River Shoshone Reservation.

DISTRICT		TROUT CREEK	SOUTH FORK	ETHETE	NORTH FORK	SAGE CREEK	BURRIS	TOTAL & AVERAGE
MEAN RATING OF ENTIRE HOUSE		1.9	2	2.3	1.8	2.2	2.3	2.
PERCENT OF HOUSEHOLDS	BELOW RESPECTIVE MEAN	53	33	33	64	66	50	50
	WITH UNSAFE WATER (BELOW 2)	74	71	34	77	84	17	70

SCALE FOR RATING

RATING	1.	2.	3.
WINDOWS AND DOORS	NONE OR MAKESHIFT	BROKEN POOR	GOOD, FACTORY
WALLS	TENT OR UNCHINKED LOG	CHINKED LOG	PAPERED
ROOF	TENT OR DIRT	TIN, TAR PAPER LEAKING	SHINGLE, TAR PAPER SOUND
FLOOR	DIRT	POOR PINE	GOOD PINE HARDWOOD
BEDDING	MATTRESSES ON FLOOR	BEDS, NO LINEN	BEDS WITH LINEN FOR CHANGE
CROWDING	LESS THAN 50 SQ. FT. PER PERSON	50 TO 100 SQ. FT. PER PERSON	100 SQ. FT. OR MORE PER PERSON
WATER	STREAM, CANAL, ETC.	HAULED FROM PIPE LINE	PIPED, RUNNING
TOILET	NONE	MAKESHIFT	GOOD OUTDOOR TOILET

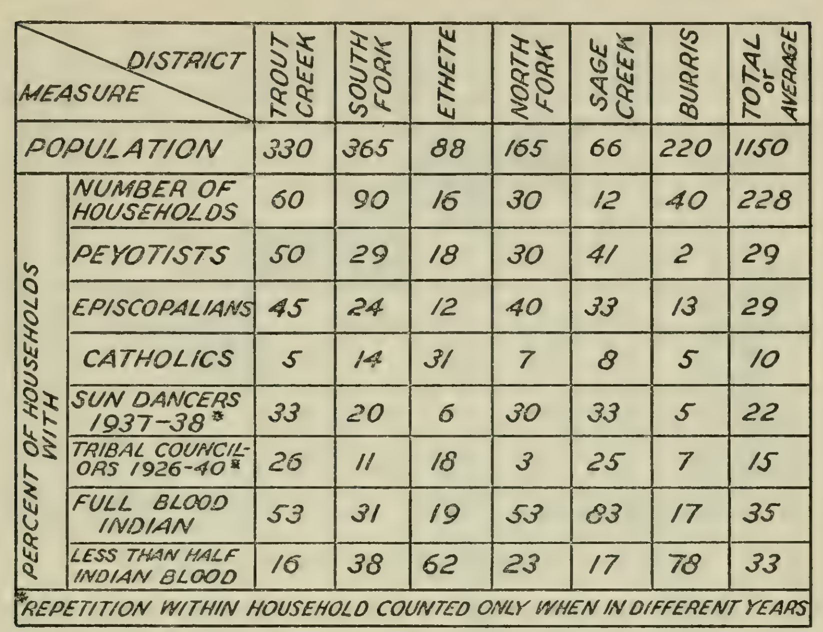
FIGURE 23.—Economic differences.

is 1.9, a little below that of the reservation generally; the range, 0.5 to 2.6 (cf. fig. 23). In short, the Sun Dancers represent all but the geographically most remote, most mixed-blooded, and wealthiest parts of the reservation.

In contrast, age is a selective factor among the dancers. The mean age is 37 years, with a range from 16 to 80. The distribution, however, is very peculiar, consisting of a low plateau with two important, nearly equal peaks in the ages of 17 to 25 and 50 to 58. Almost no men in their 30's dance.

Correlated with age is another mechanism, that of kinship. In all, in 1937 and 1938, four pairs of fathers and sons danced together, as well as six sets of brothers (two of them numbering three apiece), and one set of cross-cousins. The importance of kin ties in joining the dance—especially the father-son relationship—explains part of the peculiar age distribution.

Sun Dancing is also correlated with participation in other socio-religious organizations. Out of 336 men above the age of 16, only 167 belong to any organization whatsoever; 89 belong to 1, 57 to 2, 17 to 3, and 5 to 4. The extreme limit of duplicating participation is illustrated by a 46-year-old man who belongs to five groups at once.



MEASURE \ DISTRICT		TROUT CREEK	SOUTH FORK	ETHETE	NORTH FORK	SAGE CREEK	BURRIS	TOTAL or AVERAGE
POPULATION		330	365	88	165	66	220	1150
PERCENT OF HOUSEHOLDS WITH	NUMBER OF HOUSEHOLDS	60	90	16	30	12	40	228
	PEYOTISTS	50	29	18	30	41	2	29
	EPISCOPALIANS	45	24	12	40	33	13	29
	CATHOLICS	5	14	31	7	8	5	10
	SUN DANCERS 1937–38*	33	20	6	30	33	5	22
	TRIBAL COUNCILORS 1926–40*	26	11	18	3	25	7	15
	FULL BLOOD INDIAN	53	31	19	53	83	17	35
	LESS THAN HALF INDIAN BLOOD	16	38	62	23	17	78	33

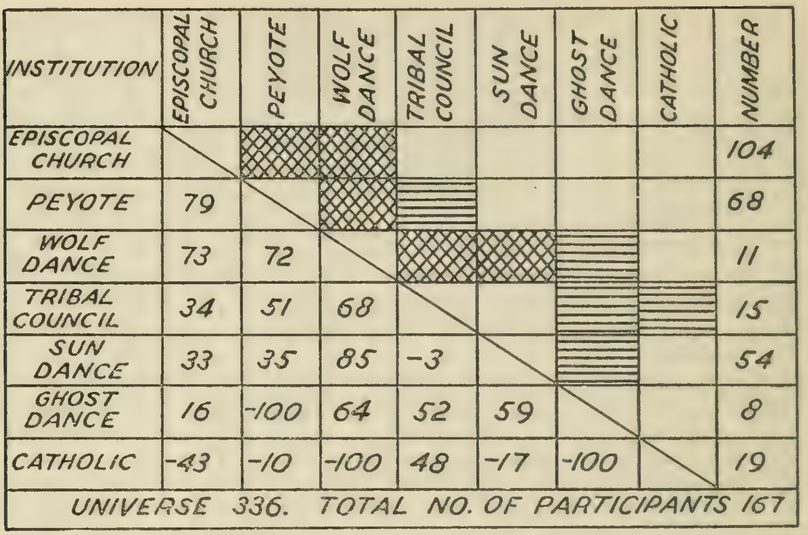
*REPETITION WITHIN HOUSEHOLD COUNTED ONLY WHEN IN DIFFERENT YEARS

FIGURE 24.—Local differences on the Wind River Reservation.

In short, there appears to be a central participating core opposed to the major nonparticipating division of the community.

Examining this core in detail, we see that the Episcopal Church, the Peyote Cult, the Wolf Dance, and the Tribal Council form a solid block. (See fig. 25.) The Sun Dance has a rather peculiar position, which is more apparent than real, inasmuch as the Tribal Council is represented on the Sun Dance committee rather than among the dancers themselves. The Catholics, on the other hand, are dissociated from all other groups except the Tribal Council. The completely negative correlations between the Ghost Dance and Peyote Cult, and the Ghost Dance and Catholicism are functionally real, not merely statistical.

Multiple participation exists despite a paucity of obvious functional ties between different ceremonies. As an explanation, there is only the historical fact that a small group of men originally experimented with all these, and integrated them slightly. This would lead one to suspect that some sort of attachment to these leaders has been the genuine unifying factor. Yet such attachment can hold only for a few families, among whom heredity, particularly patrilineal, has maintained participation in the same cults. For other families, whose affiliations have varied greatly over late generations, the problem is much more difficult. In fact, the existence of any personal ties, social or friendly, seems to be of little weight in most instances.



INSTITUTION	EPISCOPAL CHURCH	PEYOTE	WOLF DANCE	TRIBAL COUNCIL	SUN DANCE	GHOST DANCE	CATHOLIC	NUMBER
EPISCOPAL CHURCH		▩	▩					104
PEYOTE	79		▩	▤				68
WOLF DANCE	73	72		▩	▩	▤		11
TRIBAL COUNCIL	34	51	68			▤	▤	15
SUN DANCE	33	35	85	-3		▤		54
GHOST DANCE	16	-100	64	52	59			8
CATHOLIC	-43	-10	-100	48	-17	-100		19
UNIVERSE 336. TOTAL NO. OF PARTICIPANTS 167								

FIGURE 25.—Correlations (Yule Q_2) between institutions.

For example, the Sun Dance in 1937 was run by an individualistic shaman, while the Sun Dance committee was composed of people with various affiliations, led by an Episcopalian who had retired from active membership in the Peyote Cult. In 1938, two Peyotists led the dance, while the committee was entirely Peyotist. Only 9 persons out of a total of 84 danced in both years. Yet the profile of participation remained perfectly constant, with the Peyotists actually dropping a little in percentage the second year.

TABLE 2.—*Percentage of Sun Dancers* [1]

Date	Episcopalians	Peyotists	Wolf Dancers	Tribal Councilors	Ghost Dancers	Catholic
In 1937	48	39	17	10	10	5
In 1938	52	35	18	6	6	3

[1] The sum is greater than 100 percent because of duplicate participation; only Wind River Shoshone have been included in the percentages.

It appears most likely, therefore, that participation in rites at the present time is generally a matter of individual preference and individual psychology rather than one of definite social compulsion. The ties are emotional rather than legal or customary.

Analysis of the Rohrschach tests of a small but carefully matched series of Sun Dancers and nonparticipants permits tentative definition of the psychological differences between them. (See Appendix 3.) The former manifest considerably higher energy levels than the latter. Emotionally, they appear more sensual and sensitive, but basically no more extroverted. Greater mental rigidity, with almost no inner life and little originality, but less negativism and concern with minutiae than among the nonparticipants, are other characteristics.

The Sun Dance leaders represent the width and breadth of the community to a lesser degree than the ordinary dancers. Data on five leaders active from 1936 to 1938 show a wide range in home locality, degree of blood admixture (half to full-blood), and extent of social participation (two were Sun Dancers only; three, Episcopalians also, of whom two were Peyotists in addition. One man participated in these three organizations and the Wolf Dance as well.) None were members of the Tribal Council. All were poor, older men, from 50 to 77 years of age, who had danced from 10 to 15 times previously.

Constant participation has not, however, been enough to warrant leadership, which most dancers never achieve. The critical factor appears to be acknowledged supernatural power. For instance, Natopo White or Little White Horse had control over lightning. When his wife ran away with another to Utah, he caused the lightning to strike and kill the latter. He also had control over the weather. Pohguritsie Taylor is reported to be a dangerous shaman who once exhibited his Power by stealing away Pivo Brown's.

Does this recognition of special power imply a difference of personality between the leaders and ordinary dancers? I believe it does, although this conclusion is impressionistic. Such men as Tom Compton and Tom Wesaw share elements of ambivalence and of marked cyclicity in adaptive behavior, in overt personality, with the ordinary dancers. On the other hand, they appear to be much more intelligent, imaginative, and expressive than their followers. In these regards the leaders may be closer to the norms of the nonparticipants than to the other dancers.

In contrast to the dancers and Sun Dance leaders, the Committee members show definite social rather than psychological selection. Data are available on nine members of 1937 and 1938, of whom three were participants both years. Excluding one 77-year-old man, the mean age of the Committee members in 1938 was 35, with a range of 25 to 44. (This distribution fits the gap in the Sun Dancers' age curve, and provides an explanation additional to kinship for its peculiarities.) Blood admixture among the Committee members is low, with a mean of 0.83 Indian blood and a range of 1.00 to 0.37; in contrast, their economic status is high, with a mean of 2.3 and a range of 1.6 to 2.9. They are active participants in socioreligious organizations, belonging to an average of 2.5 each. While all but one are Peyotists and four are members of the Tribal Council, no Ghost Dancers or Catholics are represented, and only one has been a Sun Dancer.

Geographically, the selection is also marked, since six come from Trout Creek and two from South Fork, while North Fork, Sage Creek, and Burris are completely unrepresented.

Evidently, the Sun Dance Committee is the instrument through which the effective social leadership of the Wind River Shoshone maintains its control over the Sun Dance.

The old warriors and other persons who act as heralds, or who light the fire in the Sun Dance lodge, bless the water at the end of the ceremony, or bless the dancers, comprise a heterogeneous group. Some have had genuine war records; Quitan Quay, for example. Others such as Tassitsie and Charley Washakie have also played a major role in the creation of modern Shoshone ceremonialism. Still others, such as Marshall Washakie, the president of the Peyotists, have current claims to prominence. And some, finally, are visitors such as Ben Buffalo, a Cheyenne who blessed Tom Wesaw at the conclusion of the 1938 Sun Dance. The only common denominators appear to be middle or old age and some basis of public or personal esteem.

In summary, the modern Sun Dance is fully representative of all the Wind River Shoshone—more so, probably, than was the old Sun Dance. In addition, it is closely tied in to the social leadership of the community by means of the Sun Dance Committee. Finally, the Sun Dance today acts as an agency of cohesion not only for the Wind River Shoshone, but also for neighboring tribes. In 1936, out of 46 dancers, 6 were Arapahoes and 3 were Utes; in 1937, out of 38 dancers, 4 Idaho Shoshone; 2 Bannock; 1 Shoshone from Washakie, Utah; 3 Wyoming Arapaho; and 1 Oklahoma Arapaho participated. In 1938, the 46 dancers included 1 Crow and 1 Ute. Comparably, the Wind River Shoshone today participate in Idaho Shoshone, Ute, and Crow Sun Dances.

The aggregate social and psychological functions of the Sun Dance have increased greatly, although the importance of some has declined. The geographical unity of the modern Wind River Shoshone has reduced the importance of any physical gathering in promoting cohesion. Gossip, trade, and social gatherings are no longer coterminous with the tribal assembly for the Sun Dance, the rendezvous with the trappers, and the summer buffalo hunt. The roles of women and children are even less significant than in the old Sun Dance. Anxiety about war is no longer a factor, although war-centered traits have an important sentimental role. (This is written from the standpoint of 1937–38. It is clear that World War II and the postwar period reawakened war anxieties and revived such features as war prophecies.) Friendship has retained much of its ceremonial flavor, with blood-brothers exchanging gifts, for example. Practically, however, its significance in quarrels and war has declined, although the marital functions remain.

Finally, the ceremonial and religious life of the Shoshone has become richer with the introduction of the Episcopal and Catholic churches, the Peyote Cult, and the Wolf Dance; social foci competing with the Sun Dance appear to have been created. The Fourth of July Parade at Lander is another new disruptive element.

In other ways, the functions of the Sun Dance have increased. Illness has become the most important theme of the ceremony, one which is reiterated in all prayers. Although relief from illness is emphasized in other Shoshone institutions, such as the Peyote Cult, Ghost Dance, and Wolf Dance, to say nothing of the Agency hospital and field nurse, it has become the most frequently cited reason, in recent years, for participating in the Sun Dance. Thus Tom Compton first joined the Sun Dance hoping to recover from an injury received in football. Tom Wesaw, in addition to his other reasons, was prompted to lead in 1938 because he had previously been suffering from trachoma and in poor health generally. Lowie cites Pivo Brown's causes for entry:

> I was bloated up and had no appetite. I went into the sun dance. My fellow-dancers pressed down on my stomach and I felt as if I were to have a movement of my bowels. My excrements looked bloody and I was terrified, but I felt well thereafter and think the fasting burns out the disease. [Lowie, 1919, p. 399.]

Visionary power is still prized among the Shoshone, and the Sun Dance today is the principal mechanism for its achievement. The vision quest is no longer followed, although supernatural bequests may still come in ordinary dreams, as did Logan Brown's new Sun Dance song. The Peyotists do not use their drug for the gaining of visions, but merely to achieve a feeling of deep tranquillity and unity with God.

Participation in the Sun Dance, as leader, dancer, Committeeman or herald, is one of the few avenues to prestige open in the community today. (Other positions of honor are those of tribal councilor, Indian judge, president of the Peyotists, principal Ghost Dancer, and Wolf Dance leader.) Tribal and band chieftainship, war honors, and foppery have vanished. Economic success is extremely difficult to achieve; furthermore, the continuation of customs such as the abandonment of houses in which an adult has died tend to break down property accumulation.

Finally, new values have entered the Sun Dance. Concern for food is now expressed in the dance. Emphasis upon the welfare of the entire community including the allaying of internal suspicion and hostilities has also become manifest, as has an increasing feeling of the unity of all Indians. The monetary proceeds of the ceremony are other new incentives. In 1937–38, the average breadwinner of a family of five to seven souls earned but $300 a year, between his farming, stock raising, WPA, and odd jobs. Under such circumstances, honorable and easy positions paying $2 or $2.50 a day were lucrative prizes indeed.

An assessment of the social and psychological functions of the modern Sun Dance shows that its integration with the social structure and the value system expressed by it have increased greatly. At the same time disruptive elements have increased. Definite jealousy exists between Sun Dance leaders; the pay devolving upon Sun Dance Committeemen is a source of envy. But these are minor tensions. The Christianized, deeply modified Sun Dance of today is a vital cultural force, an active part of the social and emotional life of the Wind River Shoshone and their neighbors.

CONCLUSIONS

Historical conclusions.—(1) The Sun Dance complex developed among the Algonquian Plains tribes, possibly after 1700, and diffused rapidly through the Plains and into the Plateau. Its early form can be reconstructed through comparison of the peripheral, widely separated Kiowa and Kutenai Sun Dances. Later modifications (particularly by the Algonquians and Dakota), secondary diffusions, and tribal migrations make detailed tracing of the subsequent history of the ceremony extremely difficult.

(2) The Wind River Shoshone may have been influenced by the initial wave of diffusion of the Sun Dance complex, but it appears almost certain that the major factor in the introduction of the Sun Dance was a Comanche, Ohamagwaya Yellow Hand, who subsequently became a major Shoshone chief. Historical and comparative evidence indicates that he borrowed the ritual from the Kiowa and transmitted it to the Shoshone about 1800.

(3) Between 1800 and 1880, the Wind River Shoshone received elaborating Sun Dance elements from the Arapaho and the Crow or Blackfoot, although the ceremony remained fundamentally stable.

(4) Between 1880 and 1905, approximately, the Wind River Shoshone Sun Dance went through a period of profound change, probably induced by the insecurity of early reservation life, and guided by a small number of active cultural leaders. Christian elements were deeply integrated into the rite at that time.

(5) This new form of the Sun Dance spread rapidly into the Basin, being adopted by the Bannock and Ute about 1890, and the Hekandika Shoshone about 1906. Wind River Shoshone proselyting was an element in the diffusion.

(6) After 1905, and certainly by 1920, the new form of the Sun Dance crystallized among the Wind River Shoshone, and they resisted a number of attempted modifications. Nevertheless, the expansive

vigor of the ceremony has remained; in 1933 it diffused to the Nevada Shoshone, and in 1941 it diffused to the Crow, among whom it had previously died out.

(7) Further diffusion of the Sun Dance among the Plains tribes is likely, particularly in view of the psychological stimulus of World War II. The mechanism of intertribal participation in Sun Dances would promote such diffusion.

Sociological and psychological conclusions.—(1) Probably, the introduction of the Sun Dance about 1800 and, certainly, its modification in 1880–1905, were associated with periods of intense cultural crisis. Introduction and modification alike seem also to have been achieved by a few strong personalities among the Wind River Shoshone.

(2) The dominant Shoshone attitudes of egalitarianism, individualism, skepticism, and restraint may have been partly instrumental in inhibiting the early development of the Sun Dance. They provide explanations for the rejection of such features as formal hereditary control of the Sun Dance secret rites, and a priesthood, a Sun Dancers' fraternity, and self-torture. Physical consolidation on the reservation and the effects of White schooling, Christianity, and the Peyote Cult appear to have reduced Shoshone individualism and promoted acceptance of a common theory of the Sun Dance, as well as larger-scale and more-representative participation than formerly. Egalitarianism and individualism are still strong enough, however, to build up resentment against minority control of the Sun Dance, to lead to marked jealousy between Sun Dance leaders, and to result in appreciable variations in Sun Dance performances and interpretations.

(3) The early Sun Dance was but loosely integrated with the social and psychological values of the tribes, although it had important functions in relation to individual prestige, war, the acquisition and exhibition of supernatural power, and as a general social focus. Actually, the Father Dance was more important than the Sun Dance in promoting general welfare and as a crisis ritual. Furthermore, dreams, individual quests, and transfers were more common means of gaining supernatural power than the Sun Dance. The number of dancers was small. Finally, although coup counting took place in many phases of the Sun Dance, neither band chiefs nor the military societies had any role in the ceremony.

This loose integration with social and psychological values may have reinforced dominant Shoshone attitudes in inhibiting the elaboration of the Sun Dance. But it also appears probable that, with the advent of a major cultural crisis, the Sun Dance was sufficiently dissociated from deprived or rejected values to be a ready instrument for cultural reintegration.

(4) In contrast to the loose integration of the early ceremony, the

modern Sun Dance is the decisive binding element of present-day Wind River Shoshone. It expresses the major concerns of the community: cohesion, illness, food, and acquisition of supernatural power. It achieves a satisfying balance between defiant, sentimental nativism and dominant, white Christianity. All elements of the community, even those mutually hostile, participate in it. About a third of all the men above 16 have danced in a span of but 2 years; the others, the nondancers, apparently refrain from individual reasons based on psychological differences, rather than organized withdrawal. Members of other tribes dance or sing regularly in the Wind River Shoshone Sun Dance.

Consequently, the Sun Dance today is a vital emotional and cultural force affecting not only the Shoshone but also their neighbors. Elements of disintegration do exist within the ceremony: rivalries between religious leaders, jealousy of the Sun Dance Committee, and the threat of commercialization. Yet these appear minor, and it appears virtually certain that the Sun Dance will retain its vitality and exercise profound influence on Shoshone life for some time to come.

Further problems.—Analysis of the Wind River Shoshone Sun Dance has led to a number of conclusions concerning the cultural dynamics of that specific group and that institution. How representative in space, in time, in aspect of culture are these conclusions?

(1) How rapidly can major cultural changes (not mere disintegrations) take place, and under what conditions?

(2) To what extent can a single individual or a few dominate the introduction or modification of institutions?

(3) Is a condition of crisis necessary for major changes in institutions deeply charged with emotion, such as religion?

(4) How consistently and to what degree do the dominant attitudes of a group affect the growth of its culture?

(5) How stable are such dominant attitudes or patterns of culture?

(6) How does the degree of functional integration between an institution and the value systems of a society affect the survival, stability, or potential florescence of that institution in times of crisis?

To my knowledge, answers to these questions, answers based on the thorough documentation and full analysis of several discrete instances, do not yet exist.

APPENDIX 1

MANUSCRIPT NOTES ON THE WIND RIVER SHOSHONE SUN DANCE (1902) BY H. H. ST. CLAIR

The manuscript field notes made in 1902 by H. H. St. Clair[61] contain a succinct account of the older form of the Shoshone Sun Dance which mentions a number of features unnoticed either by Lowie or myself. Below I quote him verbatim. I have italicized the most significant passages.

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[61] Notebook IV, mss. 892, Bureau of American Ethnology, Washington, D. C., used by permission of Dr. M. W. Stirling, Director of the Bureau.

> Some medicine man has a dream that he has led a Sun Dance, and tells the people when it shall take place. *He then composes songs which he teaches to the people during the four days preceding the dance.* On the fourth day he leads the people into the mountains and they have a sham-battle, the trees representing the enemy, at which they shoot. *Then the men pick out the straightest of the trees that were hit and the women chop them down,* and the men load them up. Then they split up into two parties, the Sun-dance leader going with the trees. The wagon goes ahead and the other party drops back, and they have a sham-battle over the poles till they reach the camp. *Then the sham-battle is turned into a parade around the camp.* They then all procure willow branches with leaves to shade the Sun-dance lodge. Holes are dug and poles set up. The centre pole is forked; while raising it, they pray and sing.
>
> Two lodge-poles are connected at the tops with a rope, and each pole is held by one man . . . [unclear] . . . at the end of a song, raise the pole up. *This is done four times; the fifth time* they raise the pole as high as they can, and the two with the lodge poles run under it, catch it, raise it up, and set it solid. All the outside posts are also forked. Long ridge-poles are placed from outside posts [toward the] centre-pole. *A buffalo-head painted with white clay and decorated with eagle-tail-feathers is handed up to a man who goes up the centre pole.* This head he puts up on the fork of the pole. The small brush that has been collected is placed against two rails (one at the centre of the outside posts and one at the top.) The lodge is then complete. By this time it is usually dark and the *dancers begin to eat and drink,* fill . . . [unclear] . . . the four days' fast. All paint up with white clay, *hair as well as body. The buffalo-robes put on are also painted white.* Their whistles are hung on a string around the neck. All then gather in one place outside the medicine man's lodge. The singers and drummers are ordered to be ready. They all start out in single file from the medicine-man's lodge, with the medicine-man in the lead, and go around the Sun-dance hall four times in *single file to the right. After entering, the medicine man leads them with a praying song during which they are seated. At the end of the song they blow their whistles four times.* Then the medicine man, taking his place in the centre of the hall, prays for them all to the Great Father. *All shake their blankets then, to shake away their sickness.* The drummers come in and the dance begins. Dancing continues till midnight, when they pick out one of the men outside who has been in some fight to go and get wood with which to build a fire. The fire built, he tells of his brave deeds in past fights. Then the dance continues till morning. The singers take turns. The dancers dance up to the pole and back.
>
> In the morning at peep of dawn they sing a certain song and the dancers form in one line, sometimes two, across the hall and all raise their hands to the sun, *all the time hopping up and down in one place till the sun is up.* Then the medicine man prays to the Sun. That is the end of the first night. The singers then go home for about an hour to get breakfast, and while they are gone, the dancers change paint. They paint yellow all over and leave their robes white. The singers are then notified and the dance begins again, lasting all day. The leader's place is right opposite the entrance. In the night the fire is placed inside the door again. They pray again the second morning, and while the singers are at breakfast, the dancers paint with various colors whatever may be their medicine, bear, etc., generally on the center of the breast.

APPENDIX 2

PRINCIPAL INFORMANTS

1. BP, Ben Perry, b. '92, good on modern religious practices.
2. CW, Charles Washakie, b. '73, highly intelligent, important social innovator, well-informed; not much used. Speaks little English.
3. DW, Dick Washakie, b. ca. '59, intelligent, good on material culture, poor on religion, mythology; out of contact with his people. Speaks little English.
4. EA, Emma Aragon, b. ca. '69, representing Fort Bridger—Ghost Dance adherents; opinionated, valuable for gossip; irregular but authentic information. Good interpreter.
5. GD, Gilbert Day, b. '09, valuable Peyote and contemporary informant.
6. GR, Guy Robertson, b. '75, fair biographical and general informant, good for linguistics. Conscientious but not brilliant. Good interpreter.
7. JM, John McAdams, b. ca. '72, very good general informant, volunteering much, but sometimes in error: must be checked by others. Has been to New Mexico.
8. JQ, Jack Quin or George Guina, b. '00, excellent mythological informant, knows old culture (non-Plains) better than any other young man, somewhat impatient; not sufficiently used, as wife was poor interpreter. Speaks no English.
9. LB, Logan Brown, b. '93, illuminating on "noncrystallized" aspects of culture, Peyote, etc. Fair interpreter.
10. LS, Lynn St. Clair, b. '03, earnest student of his own people, has both the handicaps and virtues of self-education; helps all he can, very pleasant, fairly well informed. Excellent interpreter, but usually not available.
11. MT, (Moses) Tassitsie, b. ca. '52, extremely well informed, historically important himself, influential. Must be treated gently and considerately, as is very proud. My best informant. Speaks no English.
12. MW, Marshal Washakie, b. '87, knows a good deal about his culture, very much about Peyote, but is highly erratic, alternately confiding and close-mouthed, suspicious. Can be magnificent, intelligent interpreter, but is very unreliable in arranging work, etc.
13. PB, Pivo Brown, b. ca. '50 (deceased). Excellent narrator of mythology, interesting life history, well informed. Spoke no English.
14. PP, Pandora Pogue, b. ca '55, pretty well informed, was midwife, very good on household and material culture. Not very intelligent and must be forced along a little. Speaks no English.
15. PS, Polly Shoyo, b. ca '45 (deceased). Excellent informant, great knowledge of culture, sensitive, detailed, accurate. Very close to Tassitsie in quality. Was among Crow. Spoke no English.
16. PT, Pohguritsie Taylor, b. ca. '60, a Doya or Mountain Shoshone, well informed about them, and about shamanism; not very willing, must constantly be urged on. Speaks no English.
17. QQ, Quitan Quay, b. ca. '61, good knowledge of culture, but overshadowed by MT, PB. Born near Lemhi. Speaks little English.
18. TC, Tom Compton, b. ca. '85, excellent on shamanism, used for little else, but probably knows much more. Friendly.
19. TW, Tom Wesaw, b. '86, intelligent, well-informed man, not always in good health. Taciturn at first, improves greatly on acquaintance, but always a little suspicious. Good interpreter.

APPENDIX 3

ROHRSCHACH TEST DATA ON SUN DANCERS AND NONPARTICIPANTS

In 1938, a series of 185 Rohrschach tests was taken by me among the Wind River Shoshone. Detailed discussion of the results of these and associated tests is beyond the scope of this paper (Shimkin, 1947 a and n. d.). Nevertheless, certain points must be developed in order to clarify the selection of the individuals, the scoring, and the interpretation.

The samples of Sun Dancers and of men who were almost completely nonparticipants were chosen as careful matches to eliminate the effects of differing ages, economic statuses, and degrees of blood admixture. Since these variables have in effect been partialled out by this method, the residue of consistent differences between the two groups represents "individual" differences, i.e., those which cannot be ascribed to immediate environmental conditions but derive in all likelihood from differences in early development or heredity.

The fundamental basis of the scoring and interpretation of these tests is Bruno Klopfer's modification of the original Rohrschach test, as described by Klopfer and his associates in various issues of the Rohrschach Research Exchange. The peculiarities of Wind River Shoshone norms have required me to deviate in a few regards:

(1) Popular responses are based upon frequency analyses of Shoshone responses. The following have been grouped out as "P."

Frequency *Percent*	Response	Plate	Location
65. 3	A	V	W.
24. 8	A obj (hide, etc.)	VI	W (cut off).
75. 8	A	VIII	D (lateral red details).
26. 8	A d	X	D (bottom green detail).

(2) I would give the following interpretations to the total number of responses (R) among the Shoshone:

Less than 10 R	Mental inactivity (psychic or organic inhibition).
10 to 25 R	Normal mental activity.
26 to 50 R	Mental exuberance (a sign of intelligence, a "manic" temperament, or slight perseveration).
51 to 100 R	Perseveration (compulsive tendencies).
100 R and over	Severe perseveration (suspicion of compulsive neurosis).

(3) I believe that average reaction time for each response (T/R) is primarily a function of the physical energy and activeness of the indi-

vidual, significant at all levels. This would be my estimate of the meaning of the factor among the Wind River Shoshone:

Less than 0.5 minute	Excessive energy, restlessness, "manic" tendencies.
0.6 to 0.9 minute	High energy level.
1.0 to 1.3 minutes	Normal energy level.
1.4 to 2.6 minutes	Low energy level—slight physiological or psychological inhibition.
2.7 minutes and over	Minimal energy level—severe physiological or psychological inhibition.

The bases for the interpretation of general differences between the Sun Dancers and nonparticipants given in the section on the Modern Sun Dance under the heading "Social and Psychological Factors" (pp. 468–469), are appreciable differences between their means in the following factors:

T/R (energy levels);

$\frac{FM+m}{Fc+c+C'}$, Fc, C, $\frac{VIII,\ IX,\ XRG}{R}$ (extroversion/introversion indications);

O/R (originalty);

$\frac{Dd+S}{R}$, (particularism and negativism).

TABLE 3—*Differences between Sun Dance participants and nonparticipants as based on the Rohrschach test*

Factors	Sun Dance participants								Nonparticipants									Mean difference
	Designation							Mean	Designation								Mean	
	A	*B*	*C*	*D*	*E*	*F*	*G*		*a*	*b*	*c*	*d*	*e*	*f*	*g*	*h*		
Age	19	27	29	36	46	57	58	38.8	17	31	35	36	40	40	41	64	38.0	+0.8
Blood admixture (percent)	12	37	25	0	25	0	0	14	25	0	0	25	0	0	0	50	12	+2
Participation:																		
Sun Dance	×	×	×	×	×	×	×											
Peyote		×			×													
Wolf Dance					×													
Ghost Dance						×	×											
Tribal Council					×													
Episcopal Church	×	×	×		×		×		×			×		×	×			
Catholic Church																		
Total	2	3	2	1	5	2	3	2.6	1	0	0	1	0	1	1	0	0.6	+2.0
Economic status	2.0	2.0	2.1	1.0	1.4	1.8	2.1	1.77	2.0	1.7	1.7	1.8			1.8	1.8	1.80	−0.03
Rohrschach test score:																		
R	27	13	29	5	8	11	25	16.9	19	27	8	5	5	14	14	14	13.2	+3.7
T/R (min.)	.70	1.08	1.31	1.20	1.12	1.18	.88	1.07	.90	.70	2.12	3.80	1.80	.71	1.07	1.00	1.51	−0.44
F/R	.70	.46	.72	.60	.75	.45	.52	.60	.63	.40	.62	.60	.40	.43	.64	.36	.51	+0.09
$\frac{FK+F+Fc}{R}$	.96	.61	.82	.80	.87	.82	.72	.80	.68	.77	.87	1.00	.60	.50	.70	.50	.75	+0.05
H+A	6	4	18	4	4	6	11	7.6	13	12	4	2	1.00	4	9	4	6.2	+1.4
Hd+Ad	8	0	9	0	3	1	3	3.4	0	6	2	2	2	1	0	1	1.6	+1.8
$\frac{A+Ad}{R}$	.40	.31	.79	.60	.50	.54	.44	.51	.52	.40	.37	.80	1	.29	.50	.29	.45	+0.06
P/R	.11	.23	.10	.40	.37	.27	.12	.23	.16	.21	.12	.80	.20	.14	.15	.21	.25	−0.02
O/R	.15	0	0	0	0	.09	.16	.06	.05	.22	.12	0	.20	.29	.07	.07	.13	−0.07
$\frac{FM+m}{Fc+c+C'}$	0	0	0.5	0	0	.75	1.5	0.4	0.5	0.5	1.0	1.0	0	0	2.0	3.0	1.0	−0.6
ΣC	1.0	1.5	1.5	0.5	1.0	2.0	8.0	2.2	3.0	3.0	0	0	0	4.5	3.5	2.5	2.1	+0.1
$\frac{M}{\Sigma C}$	0	0	0	0	0	0	.12	.02	.67	.33	∞	0	0	0	0	.40	(−)	(−)
$\frac{W}{M}$	∞	∞	∞	∞	∞	∞	15		3.0	16	5.0	∞	∞	∞	∞	5.0		
$\frac{VIII, IX, X}{R}$	.44	.38	.33	.40	.62	.27	.32	.39	.58	.29	.12	.40	.20	.50	.28	.36	.37	+0.05

TABLE 3—*Differences between Sun Dance participants and nonparticipants as based on the Rohrschach test*—Continued

Factors	Sun Dance participants								Nonparticipants									Mean difference
	Designation								Designation									
	A	*B*	*C*	*D*	*E*	*F*	*G*	Mean	*a*	*b*	*c*	*d*	*e*	*f*	*g*	*h*	Mean	
Rohrschach test score—Continued																		
W/R	0.19	0.54	0.10	0.60	0.37	0.82	0.60	0.46	0.31	0.59	0.62	0.60	0.40	0.36	0.36	0.36	0.45	+0.01
D/R	.52	.46	.83	.40	.63	.18	.36	.48	.64	.30	.25	.40	.40	.57	.50	.50	.44	+0.04
d/R	.19	0	.07	0	0	0	.04	.04	.05	.03	0	0	0	0	.07	.14	.04	0
$\frac{Dd+S}{R}$	.10	0	0	0	0	0	0	.01	0	.08	.12	0	.20	.07	.07	0	.07	−0.06
m	0	0	0	0	0	0	1	--------	0	0	0	0	0	0	0	1	--------	0
M	0	0	0	0	0	0	1	--------	2	1	1	0	0	0	0	1	.6	−0.5
FM	0	0	2	0	0	3	5	1.4	1	4	1	1	0	0	2	2	1.4	0
k	0	2	1	0	0	1	4	1.1	1	1	0	0	0	1	0	3	.7	+0.4
K	1	1	0	0	0	1	3	0.9	2	0	1	0	0	0	0	2	.6	+0.2
FK	0	0	0	0	0	0	4	0.6	0	5	1	1	2	0	0	1	1.2	−0.6
F	19	6	21	3	6	5	13	10.4	12	11	5	3	2	6	9	5	6.6	+3.8
Fc	7	2	3	1	1	4	1	2.7	1	5	1	1	1	1	1	1	1.8	+1.2
FC	0	1	3	1	0	0	1	0.9	4	2	0	0	0	3	2	0	1.3	−0.4
CF	1	1	0	0	1	2	3	1.1	1	2	0	0	0	3	1	1	1.0	+0.1
C	0	0	0	0	0	0	3	0.4	0	0	0	0	0	0	1	1	0.2	+0.2
c	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0.1	−0.1
C′	2	0	1	0	0	2	0	0.7	0	0	0	0	0	0	0	0	0	+0.7

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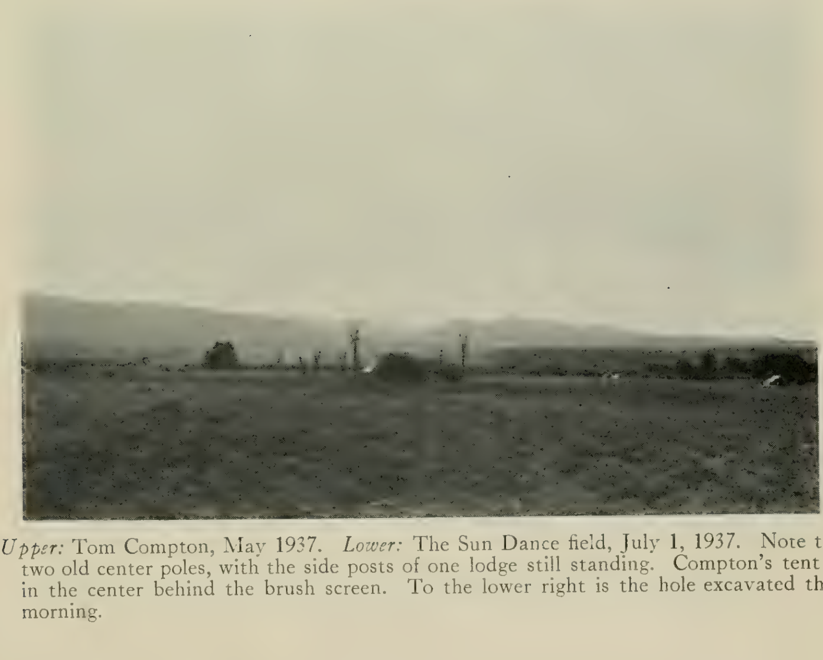
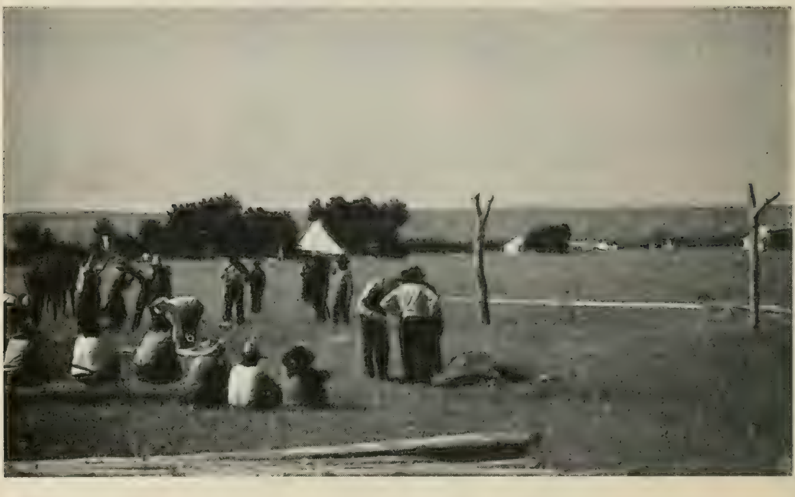
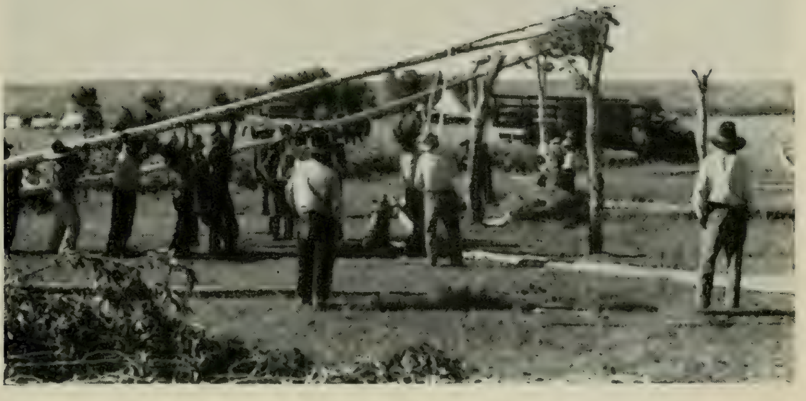
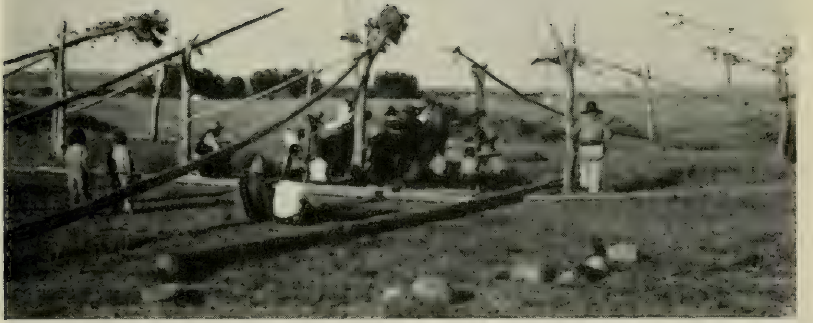


Upper: Tom Compton, May 1937. *Lower:* The Sun Dance field, July 1, 1937. Note the two old center poles, with the side posts of one lodge still standing. Compton's tent is in the center behind the brush screen. To the lower right is the hole excavated that morning.

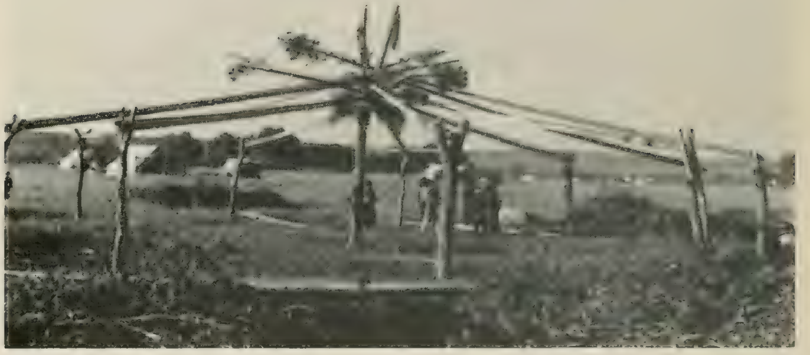


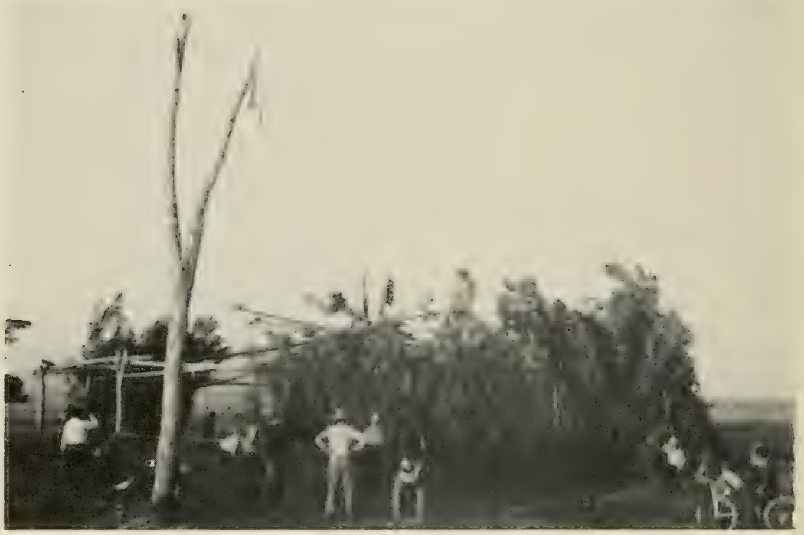
Upper: Measuring radii to locate side-post holes from the center pole. July 3, 1937. *Lower:* Compton, stooped over, fixing the buffalo head onto the center pole. Tassitsie, right, is painting it. Note the Indian Service truck used to haul branches.



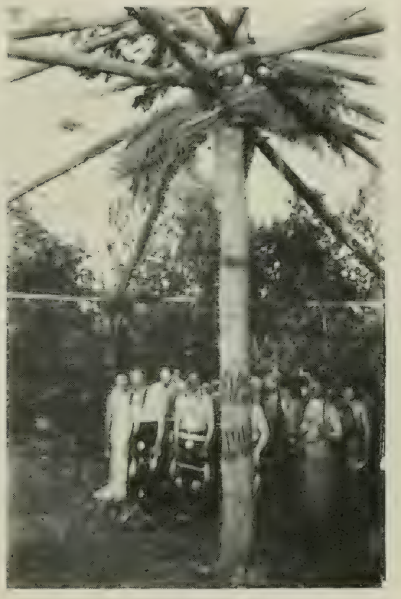


Upper: How the rafters are raised. Only one set of joined poles is being used here. *Lower:* Getting ready to lift the center pole. The tips of the rafters have been placed in the forks of the side posts; the east-running rafter is lying in the foregound.

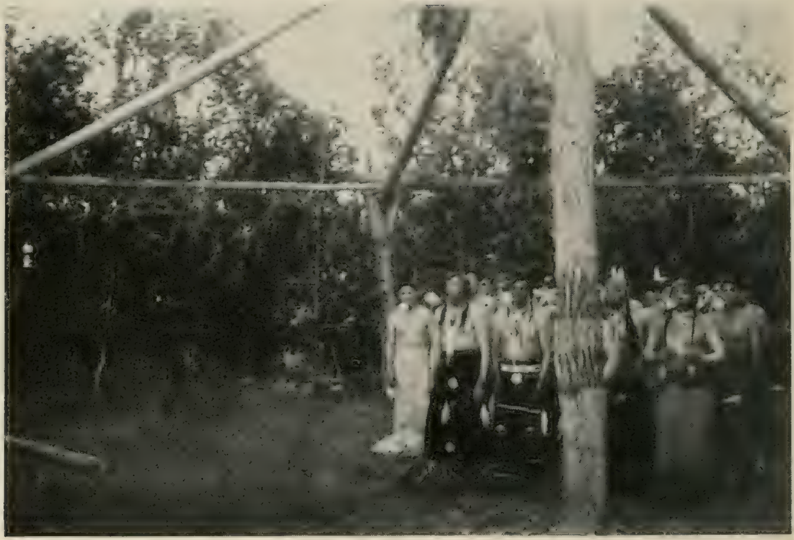


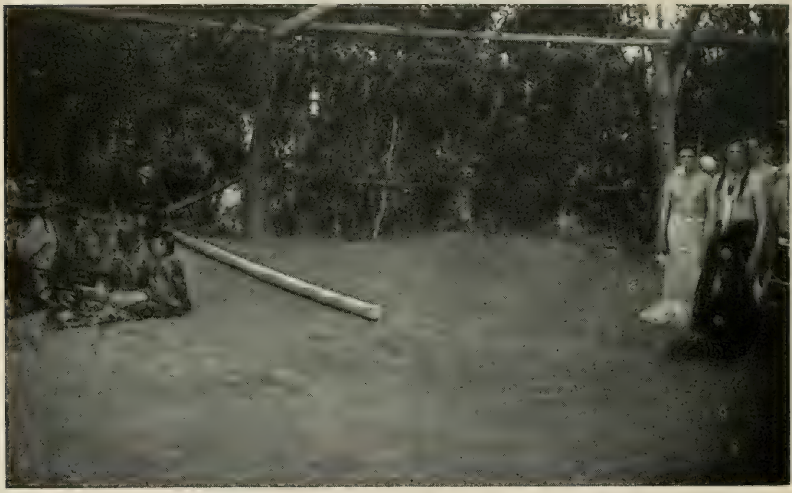


Upper: Men putting up the side roof poles, July 3, 1937, 6:50 p. m. *Lower:* The brush wall being finished, July 3, 1937, 7:30 p. m.

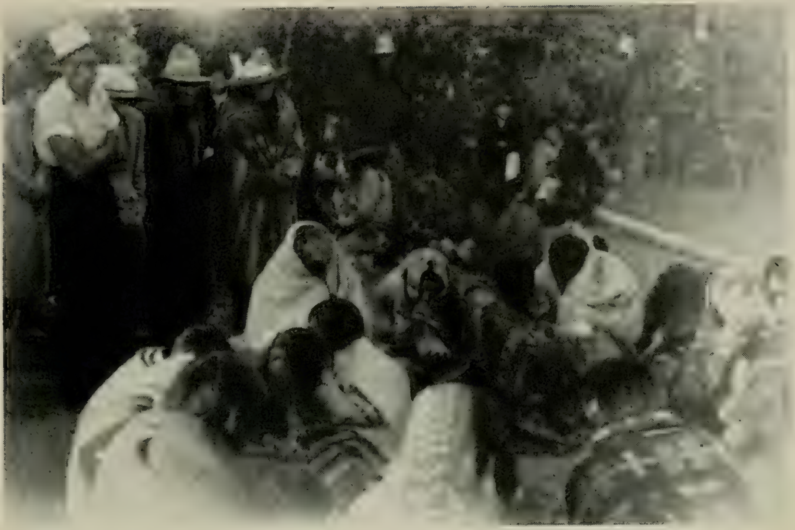


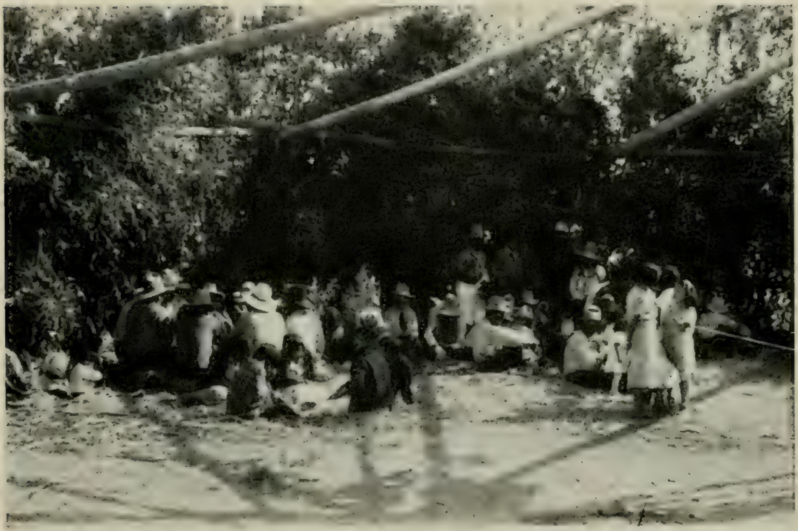
Upper: Before dawn, July 4, 1937, 4:00 a. m. The orchestra at left and women singers, huddled in blankets, in center, in front of the log separating the secular from the sacred ground. Resting dancers dimly visible in the right rear. *Lower:* The dancers greet the rising sun. Details of the center pole are also visible here: the tying of the willow bundles, the pile of rocks, the digging stick, and the two black bands.



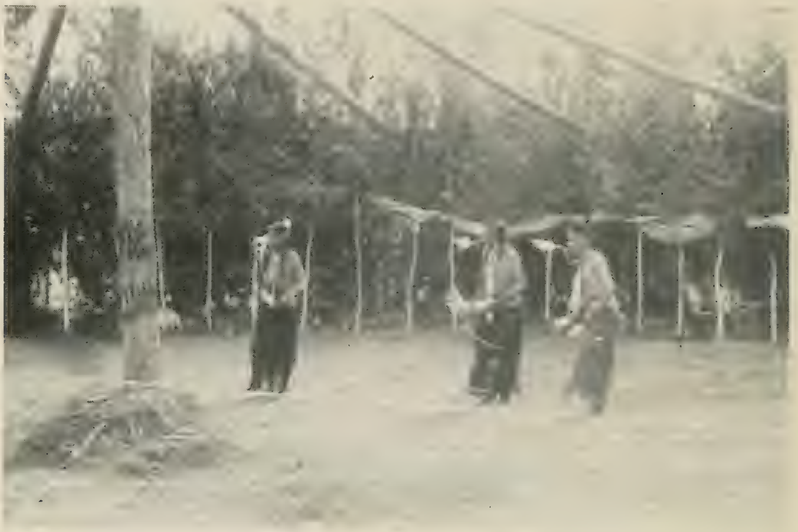


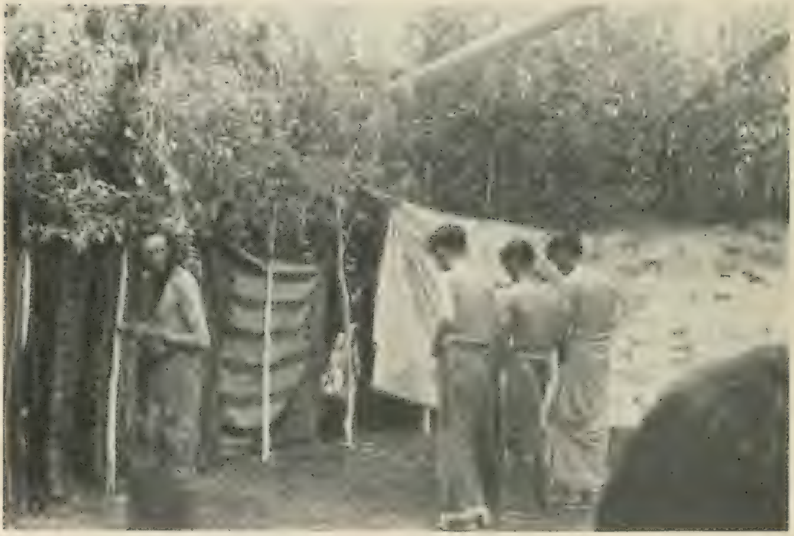
Upper: Another view of the dancers greeting the rising sun. Their blankets are at their feet. Compton, the man with the white-painted eyes, is second from the left in front. *Lower:* A third view of the sunrise ceremony, showing the spatial relations between the fire at the bottom right, the singers at the left, and the dancers.





Upper: The prayer songs around the fire. Compton is at the upper right, with face exposed. In prayer the dancers place their hands over their mouths, muffling their voices. The age of some of the dancers is evident from the white hair of the one at left center. *Lower:* Details of the orchestra and spectators. The singers are seated in a circle at the left. Just to the right of them may be seen the sagebrush branches in the hands of the women singers. Old men at right of center near the rope marking off the dancing ground. Most of the children at far right are preoccupied with things other than the Sun Dance. July 4, 1937, afternoon.





Upper: Dancing. Note the whistles in the dancers' mouths, the eagle plumes suspended from their little fingers. Most of them are resting in the sheds constructed that morning. The earth around the foot of the center pole is from the previous night's fire. July 5, early afternoon. *Lower:* Tired dancers. Compton at the left. Note that he is no longer painted and that he has changed his skirt. Observe the paintings on the cloth. July 5, 1937, early afternoon.

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Current Trends in the Wind River Shoshone Sun Dance

By FRED W. VOGET

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CURRENT TRENDS IN THE WIND RIVER SHOSHONE SUN DANCE[1]

By Fred W. Voget

INTRODUCTION

The Wind River Shoshone, situated on a reservation near Lander, Wyo., not only have maintained a modified form of the aboriginal Sun Dance as a native worship, but also have transmitted the complex to neighboring tribes.[2] The ceremonial, in both its aboriginal and modern expressions (1937), has been treated by Dr. Demitri B. Shimkin in the preceding paper of this volume.[3] The present paper is designed to supplement Dr. Shimkin's study with a presentation of data obtained in 1948 and to analyze trends in change and stability since 1937. For purposes of description the treatment will be made under the following rubrics: Sponsorship and organization, preliminary dances, lodge construction, dance practices, and ideology.

SPONSORSHIP AND ORGANIZATION

The manner of publicly announcing sponsorship of a Sun Dance and its sole direction by the pledger has been maintained, but certain changes in organization are evident. These modifications in part are traceable to the recognition of functions which were emerging in 1937, and to a weakening of the informal pattern of leadership owing to the death of men of "aboriginal" status.

Shoshone tradition emphasizes a single performance in any year, but since 1939 two performances have been given, one during the latter part of July and the other during the latter part of August. While the Shoshone have encouraged the attendance of tourists for some time, it was not until 1939 that a performance was scheduled for their special benefit.[4] In effect this meant that the Sun Dance had taken on a new function, one which implicated it in tribal enterprises designed to attract white patronage, such as the rodeo. As late as 1937, according to Shimkin, the Sun Dance was supervised by a "semihereditary" society known as the "Cree" or "Antlers." By 1939, however, an elective committee system was instituted which was empowered "To authorize and promote rodeo events, Indian dances, and entertainments among the Shoshone people and any people residing within the bounds of the reservation, who so desires to participate." [5] The new organization was placed under the jurisdiction of the Shoshone Business Council, and in 1945 a constitution and bylaws were drawn up to determine the full powers and duties of the Shoshone Entertainment Committee.[6] The above development appears to have been related to a growing dissatisfaction with financial irregularities attributed to older informal organizations, and to the spread of a responsible committee system stimulated by comprehensive Government plans to develop a measure of political responsibility and economic independence among the Shoshone.[7] The pledger, instead of contacting the semihereditary society, now communicates his intention to the committee, the members of which then assist with the arrangements. The pledger also selects six assistants, who thus constitute a sort of subcommittee, to facilitate the production of the Sun Dance. Not infrequently the members of the Sun Dance Committee may be associated with a society, but such membership is not the basis for their selection. Relationship, friendship, and ceremonial experience appear to be more significant.

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[1] The paper is an adaptation of a fuller treatment of the current ceremonial. The writer gratefully acknowledges financial assistance provided by the Laboratory of Anthropology, University of Nebraska, and the Faculty of Graduate Studies and Research, McGill University. I also wish to thank Dr. Demitri B. Shimkin for his valuable criticisms of the manuscript and for making the necessary arrangements to include it with his own publication.

[2] The ceremonials of the Ute, Fort Hall Shoshone, and Crow are traceable to the Wind River Shoshone (Opler, 1941; Hoebel, 1935; Voget, 1948 and MS.).

[3] For a detailed account of the ceremonial upon which comparisons are based, the reader is referred to Dr. Shimkin's study, No. 41, this volume.

While the primary function of the Shoshone Entertainment Committee revolves about the regulation of finances, it is also implicated in transportation arrangements and the provision of ceremonial equipment, e. g., drums, buffalo head, eagle, and cloth pennants. Moreover, ceremonial acts, such as the maintenance of the fire and the bringing of water, formerly performed by special officiants may now be carried out by committee members. In addition, spectators are formally welcomed by the chairman, and he also has charge of the distribution of gifts donated for tribal visitors. Prior to the termination of the performance a report of individual contributions to the ceremonial and of monies collected from tourists is made public. While the informal organization of the Shoshone allows a certain overlap of ceremonial functions between the elected and appointed committees, it is evident that the committee system has supplanted controls formerly exercised by the semihereditary society. It is equally evident that the function of the ceremonial has been redefined in such a way that it tends to be viewed as a public possession designed to serve the public welfare.

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[4] A telegram from the Wyoming Department of Commerce and Industry, dated April 12, 1939, requested the "medicine man" to have the "Great Spirit" tell him to set a definite date for the dance during the last week in July; hence, the annual scheduling of the performance for July 26.

[5] The citation is from the constitution of the Shoshone Entertainment Committee as of 1945, but it accords with the intent of the committee elected September 10, 1939.

[6] This information was supplied by Mrs. J. W. Schultz. As of 1948 the constitution of the committee had yet to be approved by the tribal council.

[7] Dissatisfaction over the handling of funds is probably of long standing, for one informant stated that the Poke-in-Nose society had been revivified ca. 1930 to correct the misuse of funds by members of the Antlers.

The ceremonial role of the sponsor has not diminished perceptibly in the face of the above committee development. Moreover, older men, frequently members of societies and experienced Sun Dancers, volunteer their services and cooperate fully with the pledger in the direction of the performance. It is apparent, however, that a weakening of the informal leadership structure has resulted from the gradual decline in the number of men who had grown up in the shadow of the aboriginal culture. This has allowed rival leaders to emerge, some of whom are endeavoring to change the ceremonial whereas others are seeking to maintain a status quo.[8] The Shoshone tend to contrast present Sun Dance leadership unfavorably with that of the past, and informants generally were of the opinion that the powers exercised by current leaders were not so great as those of former years. It is not unlikely that dual performances are symptomatic of emergent factions, for the predominant full-blood membership and the nature of the August performance in 1948 suggest an alinement of conservatives. Certainly dissatisfaction with a particular performance was cited as the reason for a second. Again, undue individual hardship was reported as a motive for sponsoring a second performance.

Sponsorship of the Sun Dance and participation have remained the prerogatives of males. Fifty-six dancers performed in the July and 33 in the August ceremonials respectively. Of the latter, 26 were Wind River Shoshone, the remainder being distributed among the Ute, Idaho Shoshone, and Arapaho. Participants disclosed a range of 15 to 68 years in age, with a mean of 38 years. A break-down according to age disclosed the surprising fact that nearly half of the performers were under 30 years, and of these 9 were from 15 to 19 years of age.[9] Full-bloods (including one individual rated 7/8) constituted nearly 72 percent of the participants, whereas in the population at large they totaled no more than 26 percent. Fifteen of the twenty-six Shoshone participants, including the sponsor, were Peyotists.[10]

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[8] For an account of John Truhujo's sustained attempts to introduce substantial changes in the ceremonial, see Voget, 1950.

[9] The threat of induction into the Army probably accounts for the unusual number of youths in the ceremonial.

[10] From data supplied by Shimkin with respect to participation in the ceremony witnessed in 1937, certain correspondences and differences are revealed. Of 23 participants listed, nearly one-third were under 30 years of age. Their ages ranged from 19 to 77 years, the average being 38 years. Full-bloods comprised some 43 percent of the participants, a figure significantly lower than that recorded for the 1948 performance but nonetheless weighted in favor of racial purity. The number of Peyotists totaled 10.

The contributions of women for the most part were routine, such as singing, the bringing of bedding, and the preparation of the feast. No women were observed to help in the construction of the lodge.

PRELIMINARY DANCES

While four preliminary dances usually precede a Sun Dance performance, the minimum requirement is two. The increasing use of two as a ritual number in the Sun Dance was remarked by Shimkin (1942, p. 459), an innovation which he traced to Peyotism. A degree of variability, however, appears to have been characteristic of this subcomplex, for in 1912 Lowie (1919, p. 393) reported a total of three singing dances for the ceremonial.

Theoretically the function of the singing is to render the area for the main performance sacred, but no effort was made to control the movements of spectators, who encroached freely on the "sacred" area west of the fire. Several informants stated that approximately 15 years before no one would have been allowed west of the fire unless he were to remove his shoes. The perfunctory character of current preliminary dances is impressive and indicates a lack of interest which probably is the prelude to disappearance, as Barnett observed, among societies in northwestern California.[11]

LODGE CONSTRUCTION

Religious activity among the Shoshone, as among most nomadic Plains tribes, has been characterized by a loose ceremonialism rather than by an integrated ritualism. The primary emphasis has been upon the psychic experience of the individual in relation to the supernatural, and thus it is not surprising that the minutiae of ordered form have been neglected. This emphasis upon the end rather than the instruments thereto has allowed individual changes in content, provided they conformed to a minimum definition, and also has influenced the reaction of the group to the introduction of Euro-American artifacts. Thus, the Shoshone have not hesitated in the past to use wagons to haul the timbers to the lodge site, and currently trucks and trailers are coming into vogue (Lowie, 1919, p. 393). In the same vein we note the early introduction of the ax, crowbar, shovel, rope, wire, stuffed eagles, and mounted buffalo heads to facilitate the construction of the lodge.

Activities in relation to lodge construction were informal and without significant direction by the sponsor, who appeared to rely equally upon his assistant and another experienced dancer. These men proceeded at a leisurely pace from one task to another, and when stoppages would occur, the group would confer and soon dispatch a younger man for the required tool or rope. A limited amount of organization was suggested by the pairs of young men assigned to dig the post holes. These were referred to as a "detail," and it was stated that they were to be relieved after a few hours' work. The relief, however, did not materialize.

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[11] Barnett, 1940, pp. 44–45. Shimkin (personal communication) observed that the preliminary dances which he witnessed struck him as more perfunctory than that described by the writer.

The construction of the lodge, as Shimkin has indicated, involves a basic sequence of events; but few of these appear to be impervious to variation. In the digging of post holes, special attention was given first to the center post and secondly to the west post and it is quite probable that this sequence is more or less enjoined. For the remainder of the post holes, the workers began at the points marking the entranceway and proceeded in a counterclockwise and a clockwise direction respectively. The erection of the posts marking the perimeter disclosed a basic counterclockwise sequence. When erecting the rafters, special attention was paid to the cardinal points, west, east, south, and north, and then a basic clockwise sequence was followed. The stringers used to lock the rafters in place also were laid in a clockwise manner, beginning with the entranceway.

Certain modifications appear to be in line with a functional redefinition of the complex to accord with current problems and to accommodate to the model of Christian worship. Foremost among such changes is the progressive loss of ceremonial traits deriving from the war complex, a trend also reported by Shimkin. According to Lynn St. Clair, no coup has been struck on either the center pole or the forked rafter preliminary to felling since 1946. The assault on the lodge timbers after they have been brought to the camp is usually omitted,[12] and the ringing of the center pole with charcoal bands by warriors who recite their coups is no longer found.[13] Several informants traced the above omissions to a lack of eligible officiants owing to the death of men of aboriginal status.[14] The Shoshone, unlike the Crow, have not equated veterans of world wars with aboriginal warriors and allowed the former to substitute in the ceremonial situation (Voget, n.d., MS.). Instead, the Shoshone have substituted prayers by the sponsor. The veteran has been included in the contemporary ceremonial, but only by the introduction of a special subcomplex involving the American flag.

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[12] A sham battle was included in the July performance, presumably because of the tourist emphasis.

[13] The Shoshone apparently do not insist upon the decoration of the pole, but leave the decision to the pledger. In the July performance the base of the pole was smeared with yellow paint; in the August performance the pole was undecorated.

[14] "The reason for selecting these old men to strike the pole is because he had been in many wars and he was protected, we believe, by the Father . . . . And then he has that privilege to strike that pole and then he could tell about that deed in form of a prayer. He prays that all the young people be protected like he was through those wars and that his people be healthy and that today they be protected from disease like he was protected from arrows and bullets. But today we have no old men like that to give us blessing like that and the sponsor . . . has to pray . . . for everything . . . ."

Various subcomplexes which appear to be stabilized in Shimkin's description now seem to be characterized by instability. Thus, the decoration of ceremonial objects, such as the buffalo head and the eagle, is falling into desuetude. Variation in the color of the pennants attached to the forks of the center pole also is apparent. During the 1948 performances, yellow-and-gray and red-and-blue pennants were used in contrast with the usual blue-and-white. While this trait may be potentially variable, owing to the fact that it is the pledger who decides the colors according to his dream, nevertheless it is significant that individuation is so frequent. The attachment of the eagle likewise demonstrates variability; in 1937 Shimkin described the eagle as facing east, whereas in Wesaw's performance in 1948 it faced west.[15] As I have indicated elsewhere, John Truhujo has endeavored to introduce form elements currently integrated in Peyote ceremonialism which he considers aboriginal (Voget, 1950).

DANCE PRACTICES

Ceremonial practices revealed no fundamental changes from those recorded by Shimkin in 1937, but it is evident that a basic trend of simplification is proceeding. The dress of the participants is becoming simplified by the loss of the apron worn over the fringed skirt, although this trait is retained by older men. On the other hand, American artifacts have been accepted increasingly as adjuncts to a dancer's toilet and dress. Thus, towels, wash basins, mirrors, lipsticks, and modern jewelry are standard equipment for the individual performer.

As an adjunct to the drumming and singing, the gourd rattle is used sporadically; it was first employed during the second day of the performance witnessed. The fire is no longer kindled ceremonially by an old warrior, and both coup recitations and shamanistic performances are obsolescent. Attempts by Truhujo to introduce special ceremonial prayers have not met with success, but a close friend, Tilton West, performed a formalized smoking with the pipe during the dance sponsored by Tom Wesaw.

The ideal of striving for the closest contact with the supernatural, epitomized by the semitrance faint, is still expressed, but it is doubtful whether it occurs any more. Rather, an increasing reliance upon dreaming is apparent, for no prolonged dancing by a single performer was observed. And, indeed, the old men appeared singularly unenthusiastic in their encouragement of the performers.

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[15] The variability may derive from individual inclination, for Tilton West, a close friend of Truhujo (who insists that the eagle should face west), attached the eagle in the August performance. In the July performance Truhujo attached six eagle feathers to each fork of the rafter instead of at the crotch, as is customary.

A special subcomplex involving the American flag appears to be permanently incorporated in the ceremonial.[16] The flag is raised every morning before the resumption of the dance following the sunrise ceremony and it is lowered in the late afternoon when the performance is again about to be interrupted. The subcomplex involves a pole (entirely stripped of bark to resemble the usual flagpole) erected at the entranceway, an American flag donated by a woman whose son was killed in action, special flag song, standing of all participants and nonparticipants with head uncovered and facing the flag, drumming and singing solely by a Shoshone group led by the inventor of the song, prayer by the sponsor, and veteran personnel to handle the flag. The incorporation of the above during the war (ca. 1945) emphasizes the sensitivity of Shoshone worship to current problems and the reemergence of the predominant aboriginal function of the ceremonial in relation to war.

Curative practices emphasize the basic pattern of prayer and brushing of the patient with a fan or wing of the eagle, as reported by Shimkin. However, each practitioner maintains a certain individuality in technique and a differential in power is recognized by the public at large. A possible change in the position of patients undergoing treatment may have occurred, for in the 1937 performance they faced west, whereas in 1948 they faced east. However, it is more probable that east facing and west facing were alternatives in 1937 according to the individual practice of the shaman.

The August performance also witnessed the introduction of an alternative to the usual custom of blessing the participants immediately prior to the termination of the dance. All the performers were blessed in groups by the medicine men during the course of the afternoon. In this way the terminal ceremonies were shortened and the blessing by respected nonparticipants obviated. The surprise and complaint which this action elicited probably indicate that it will not become stabilized as an alternative.

IDEOLOGY

The contact of the Shoshone with Christianity, as Shimkin (1942, p. 458) has observed, led to a profound reorientation of the Sun Dance. Christian influences relate to new meanings attributed to the ceremonial as a whole as well as to specific form elements. The conception of the Sun Dance as a "religion" and reinterpretations, such as the center pole and the rafters in terms of the crucifixion and the Twelve Disciples, proceeds apace. Thus, Lynn St. Clair interprets the forked rafter as Judas,[17] and Truhujo conceives the north and south poles to be representative of the two thieves. The latter also has developed a set of "12 commandments." While it is possible that initial attempts at Christian reinterpretation were accommodative in character, the trend is basic today.

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[16] A similar use of the flag developed among the Crow. While diffusion is not to be ruled out, it is not unlikely that a parallel development has occurred, for the Crow commonly make use of the American flag during their festive annual encampment (Voget, n. d., MS.).

The influence of Christianity is also observable in the inflated role of the Creator.[18] While a Shoshone devotee may personify the center pole, buffalo, sun, and earth in address, nevertheless the Creator is first petitioned, and He is usually equated with the Christian deity (cf. Shimkin, 1942, p. 458). It would appear as if Christian ethic has made little impression on the Sun Dance, aside from a general emphasis upon peaceful relations with others. The Sun Dance is not conceived in terms of the moral regeneration of the individual—it is still an individual technique for living and not a technique for salvation.

DISCUSSION AND CONCLUSIONS

Both Linton and Barnett have demonstrated that a consideration of culture traits and complexes with respect to form, meaning, function, and principle allows much insight into the process and range of permissive modification (Linton, 1936, pp. 402–421; Barnett, 1940 and 1942). From acculturative investigations among three northwest California societies Barnett concluded that the critical factor in the modification of culture lay in the affective meaning-function associated with a specific form element or complex (Barnett, 1940, p. 42; 1942, p. 15). Changes effected in the Shoshone Sun Dance tend to support the emphasis upon function.

To participant Shoshone the Sun Dance is, above all, a form of worship. It is native worship insofar as the dance was revealed to the Indian long before he had knowledge of the Bible; it is Christian worship inasmuch as prayer is directed to God and the ceremonial comprises elements which can only be interpreted in terms of Christian teaching. It is as if God revealed His worship to the old Shoshone without indicating its full import. As the Shoshone have become familiar with biblical history and teaching, they have learned increasingly the "why" of various practices. Thus, in the construction of the lodge 12 rafters rest upon a center pole, just as the Twelve Disciples leaned upon the Savior for their support. The functional redefinition of the Sun Dance in terms of a religion thus has been of the utmost significance. It has led not only to the equation of the native and Christian creators, but also to an inflation of the role of the godhead. Other members of the Trinity also have been incorporated into the world of spirit forces still petitioned by the Shoshone. The place accorded these Christian spirit forces, however, appears to be a prominent one; for leaders of the ceremonial are wont to emphasize the intercessory role of the native forces. Thus, according to aboriginal conception the willows moved in unison by the women's chorus promote abundance; but to achieve the abundance of fruits of the earth prayer today is directed to God through the willows. A similar emphasis upon intercession is noticeable in the self-effacing attempts of the doctors, who explain their cures as due to the activàtion of some spirit force, notably God. The reinterpretation of the Sun Dance in terms of a "church" has also contributed materially to the simplifying of the ceremonial through the loss of traits associated with aboriginal warfare and shamanism. A change in function-meaning in effect has rendered the above subcomplexes obsolescent and resulted in their progressive disappearance.

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[17] "We know they tell us that one of the disciples, when this people ordered their ruler that Jesus should be crucified—one of his own disciples told the soldiers that he would go and kiss the Saviour and 'that is the way you will know that is the right one that you are seeking.' And all over the Indians use this sign for liar, and we have this pole [forked rafter] and it is the first pole that contacts the center pole. And yet those old Indians didn't know what they had. That's why we have a lot of respect for the Sun Dance. If we believe in it and use it as near like as the old Indian believed in it, we get good out of it."

[18] A similar importance has been attributed to the Creator in Peyotism. (See, e. g., Petrullo, 1934; also Radin, 1923.) With respect to the Ghost Dance of 1870 Du Bois (1939, p. 138) suggests that "much of the Californian idea of a supreme being is a post-Ghost Dance crystallization. Quite probably prior to Christian influences a supreme being was imminent in Californian ideology, but it was vague and without attributes. Christian and Ghost Dance stimuli were necessary to crystallize the concept into a clarity which now permits the Indians to render it by the English word 'God.' "

It is evident, however, that the basic function of the ceremonial, the alleviation of anxiety-producing conditions facing the individual, has remained constant, whereas the meaning content has changed. Under aboriginal conditions the Sun Dance appears to have been a prophetic instrument in relation to war, whereas its postreserve functions have been to restore individuals to health and to acquire the powers thereto. Herein lies a substantial basis for the perpetuation of the religious complex in the face of the substitutes offered by Christianity and modern medical practice. And, in connection with thèse function-meanings of the Sun Dance, it is notable that the prayer in attitude of benediction and Christian protective devices (e. g., the cross) are the only Christian forms which have been incorporated into the ceremonial. Prayer has been substituted for aboriginal ceremonial acts, and it is so important to the treatment of a patient that the curative technique is virtually a blessing. It is probably owing to the maintenance of the curative function of the ceremonial that the influence of Christian ethic has been minimal.

The development of a new function for the Sun Dance is found in its exploitation as a tourist attraction. This has resulted in the emergence of a new organization modeled upon the committee complex of the dominant society. The immediate need has revolved about the regulation of finances, and has resulted in the over-all direction of the ceremonial by an elective tribal committee and the supersession of the informal societal organization formerly associated with the production of the Sun Dance. However, the new organization has not interfered significantly with the basic ceremonial organization: a dance is pledged by an individual who receives divine sanction and who exercises rather full control over the ceremonial activities.

While the reinterpretation of the total complex as a native-Christian worship is well established, the number of form elements to which a Christian meaning is invariably attributed is limited to two, namely, the center pole as the cross and the rafters as the Twelve Disciples. The remainder of the form elements may be given a native or a Christian meaning, and occasionally an informant admits to a dual cultural interpretation.

Finally, the underlying principle of the Sun Dance, evocation of supernatural sympathy through bodily deprivation, also is equated with presumed Christian principle by citing Christ's fasting and suffering during a period of 40 days and nights.

From a review of the data the following conclusions may be offered:

(1) The predominantly native form of the Sun Dance has been stabilized owing to the reinterpretation of the ceremonial as a *revealed native-Christian worship*. In this process of stabilization the ceremonial has become simplified through the loss of certain aboriginal traits associated with complexes no longer functional under the modified conditions. Realizing that their current ceremonial does not measure up to the aboriginal expression either in content or in spirit, the Shoshone have rationalized the losses by pointing to the disappearance of the aboriginal culture—a situation which does not allow fulfillment of the old conditions of the dance. The above redefinition of the ceremonial also has developed an attitude, which, on the one hand, stimulates the attribution of Christian meanings to established forms, and on the other, proves an effective bar to the reintroduction of aboriginal elements. At the same time the death of men of aboriginal status has contributed to a weakening of the informal pattern of leadership and resulted in a relaxation of controls upon the individual. This has allowed the emergence of rival leaders who in time may head opposing factions.

(2) The basic function of the ceremonial has remained constant, but new functions have been added in response to current sociocultural conditions. An addition of function has resulted in the incorporation of a new subcomplex rather than in the assimilation of the new function by established forms. Speaking generally, one may conclude that a change in function has preceded and tended to shape changes in form and form meanings.

(3) The basic principle of the ceremonial has remained constant, but its objective manifestation has been moderated. Moreover, a new meaning has been attributed to the principle to accord with Christian tradition.

In brief, the result of the above modifications is the emergence of a syncretic complex which may best be characterized as native-modified. Basic form, function, and principle have demonstrated a high degree of constancy, whereas the associated meanings have evidenced much variability. The majority of changes in form have resulted from disappearances rather than from additions. When additions have been made, they are based upon the elaboration of special functions or the development of new functions.

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